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1947

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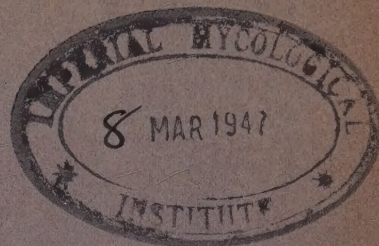
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The delay in publication is regretted. It is due to the damage sustained by the printers through enemy action. It is hoped that normal dates of publication will soon be resumed.

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[No. 1.

DISEASES CAUSED BY BACTERIA AND FUNGI

DOLMAN, C. E. (1944.) **Antigenic properties of *Staphylococcus enterotoxin*.**—*Canad. J. publ. Hlth.* **35.** 337–351. 1

Growth of a food-poisoning strain of staphylococcus on a soft agar medium for three and a half days at 20°C. yielded a filtrate of high enterotoxin potency but no detectable α or β toxin. In human beings small subcutaneous doses did not produce marked reactions except in one case. A filtrate from the same strain grown in 30% CO₂ at 40°C. was incubated with formalin to remove all α and β toxin. Injections of this produced only negligible reactions. Formalized filtrate increased resistance in human beings at least five-fold. Cats developed resistance far less readily than human beings. They showed cross protection against heterologous filtrates. Specific neutralization of enterotoxin was demonstrated by injection of enterotoxin-serum mixtures in cats. *Staphylococcus enterotoxin* is considered to be an antigenic entity.—R. GWATKIN.

*LE BUSSY, I. J. DE C., & VAN LOGHEM, J. J. (1943.) **Natuurlijke agglutinatie van *Staphylococcus aureus*.** [Natural agglutination of *Staphylococcus aureus*.]—*Ned. Tijdschr. Diergeneesk.* **87.** 1164–1168. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)* **144.** 391–392.] 2

The authors studied the nature of natural agglutination of *Staph. aureus* in human beings and dogs of different ages by direct methods as well as with the Castellani technique. They accepted the hypothesis that the bacterial antigen, which has been incriminated as the stimulus for the development of the cellular reaction, is also the stimulus of the humoral antibody.—R. A. R.

FOLEY, G. E. (1943.) **Identity of a lethal agent in broth filtrates of hemolytic streptococci with erythrogenic toxin.**—*Science.* **98.** 370–371. 3

A lethal agent has been described which is produced by Group A haemolytic streptococci in broth cultures and which is similar, in some respects, to erythrogenic toxin. There seem also to be at least two kinds of haemolytic toxins

related to these organisms, the heat-stable erythrogenic toxins and those which are heat-labile and haemolytic. F. describes the effects in mice of heated and unheated erythrogenic toxin intravenously injected, by which method 15,000 skin test doses produced a rapidly fatal result. Exposure to temperatures up to 100°C. for 20 min. did not completely inactivate the toxin. Thus the agent present in broth filtrates of haemolytic Group A streptococci was indistinguishable from erythrogenic toxin with respect to heat stability and lethal action on mice. Neutralization by erythrogenic antitoxin obliterated the lethal action in mice of broth filtrates of streptococci and F. considers that unless it can be shown that the lethal agent remains after the absorption of erythrogenic toxin with antitoxin, it cannot be considered distinct from that toxin.—J. C. B.

STEVENSON, W. G. (1946.) **Injury as a cause of mastitis.**—*Canad. J. comp. Med.* **10.** 115–116. 4

S. describes cases of mastitis of long standing caused by injury in a herd of 40 milking cows. Physical examination of several of the animals revealed that the mucous membrane of each teat sphincter was slightly everted. Following the installation of a new gauge, the milking machine was found to be developing 19 in. of vacuum instead of 15 in. Nineteen of the 22 infected quarters responded to infusions of penicillin but subsequent bacteriological examination indicated that several quarters were still infected. Once the cause of teat injury was removed, however, serious trouble disappeared.—J. W. PULLIN.

*ZOLLIKOFER, E. (1943.) **Die Kaseinzahl der Milch bei normaler und gestörter Sekretion.** [The casein number of milk during normal and disturbed secretion.]—*Mitt. Lebensm. Hyg., Bern.* **34.** 74–79. [Abst. in *Biol. Abstr. Sect. F.* **19.** No. 5. 31, amended.] 5

A quarter of an udder may be assumed infected if the Cl sugar number is at least 0.6 higher and the casein number at least 2.9 lower

than that of the healthy quarter having the highest Cl sugar number and the lowest casein number. [Many attempts have been made to find a relationship between the two constituents of milk, chlorides and lactose. KOESTLER (1922) suggested that the value $100 \times \% \text{ Cl} \div \% \text{ lactose}$ (the Koestler number) is of value as an indication that the milk is from a diseased udder.] These results confirm the data of VAN LANDINGHAM *et al.* [see *V. B.* 12. 255]. Thus a slight mastitis can be revealed indirectly by chemical methods with great certainty. Practical applicability of such a procedure is restricted.

HOMBURGER, F., WILCOX, C., BARNES, M. W., & FINLAND, M. (1945.) **An epizootic of pneumococcus type 19 infections in guinea pigs.**—*Science*. 102. 449-450. 6

An outbreak of type 19 pneumococcus infection of the respiratory tract of g. pigs is recorded, probably for the first time, in the U.S.A. The same organism was found in the respiratory tract of apparently healthy g. pigs. Sulphadiazine appeared to control the infections in part, but did not eliminate the carrier state.—JEAN P. BUXTON.

PLUM, N. (1945.) Om Miltbrand i Danmark i Aarene 1932-1943. [**Anthrax in Denmark in 1932-43.**]—*Maanedsskr. Dyrlaeger*. 57. 15-26. 7

The incidence of anthrax in Denmark has decreased considerably since 1932. In 1941 and 1942 no case and in 1943 only one case was diagnosed in the State Veterinary Serum Laboratory, Copenhagen. The number of diagnoses made by veterinary surgeons also declined in the same period.

A change is proposed for the P.M. examination of carcasses from animals believed to have been affected with anthrax; carcasses should be taken to the nearest destructor to avoid unnecessary movement of dangerous material.

Information communicated by the Statistical Department does not appear to furnish any grounds for assuming that imported oil cake may be the source of infection.—R. PETER JONES.

*MAZZA, G. (1942.) Sulla influenza del sangue e del siero di pollo nella evoluzione della infezione carbonchiosa. [**Influence of fowl blood and serum on the development of anthrax.**]—*Boll. Sez. ital. Soc. int. Microbiol.* 14. 119-122. [Abst. from abst. in *Zbl. Bakt. I.* (Ref.). 144. 337.] 8

The course of anthrax experimentally produced in rabbits and g. pigs was not influenced by the injection of blood or serum of fowls, whether normal or hyperimmunized against anthrax.

—E. KLIENEBERGER-NOBEL.

RAMON, G., BOIVIN, A., & RICHOU, R. (1942.)

Immunisation active contre le charbon au moyen d'un vaccin anavirulent et stimulé. [**Active immunization against anthrax by an alum-stimulated "anavirulent" vaccine.**]—*C. R. Acad. Sci., Paris*. 215. 498-500. 9

This vaccine is prepared from a highly virulent culture of *Bacillus anthracis*. A broth medium, containing a small proportion of agar, is seeded with a heavy suspension of the organism from solid agar cultures and incubated for 48 hours. The growth is formolized, incubated at 41-42°C. for four days and tested for sterility. The immunity stimulated by the dead organisms is reinforced both by the agar present in the medium and by the addition of 2% alum to the final product. The authors consider that this vaccine is superior to the classical Pasteur vaccines in protecting sheep against anthrax.—I. W. J.

PULLIN, J. W. (1946.) **Tuberculous lesions of swine. I. Survey of lesions found in Eastern Canada.**—*Canad. J. comp. Med.* 10. 159-163. [French summary.] 10

P. describes the examination of 232 lymph nodes from swine classified as tuberculous by Inspectors of the Health of Animals Division. Acid-fast organisms were demonstrated in 164 (70.6%) by microscopic examination, cultures or animal inoculation. Of these, 104 contained organisms of the avian type in sufficient numbers to produce TB. in chickens. The bovine type was found in two lesions only. *Corynebacterium equi* was found in 21% of the lesions. *C. equi* failed to infect swine whether administered *per os*, or subcutaneously or intravenously. The animals were kept under observation for a period of five months. Cultures of this organism had little effect on g. pigs, rabbits, mice, rats, ferrets, hamsters and fowls.—R. GWATKIN.

BANKIER, J. C. (1946.) **Avian tuberculosis. Observations on chickens infected by subcutaneous inoculation of tuberculous lesions from swine.**—*Canad. J. comp. Med.* 10. 164-167. [French summary.] 11

Chickens injected with lesions from swine were tuberculin-tested at monthly intervals, commencing 5-6 weeks after inoculation. Tests and autopsies on 84 birds gave no evidence of correlation between the first appearance or the degree of reaction and the extent of the lesions. The thymus glands were frequently involved. Lesions in these were detected in the living birds and confirmed on autopsy. In general, the thymus presented more advanced lesions than the other tissues and had a greater concentration of tubercle bacilli. Bone marrow was commonly affected but very few birds developed intestinal lesions. The variations encountered in repeated tuberculin

tests and in the autopsy findings indicated that similar variations might be expected in naturally infected birds.—R. GWATKIN.

*LEDERER, G. (1948.) Fischtuberkulose. [TB. in fish.]-Zool. Gart., Frankfurt. 15. [Abst. from abst. in *Schweiz. Arch. Tierheilk.* 86. 168.] 12

TB. appears to be a widespread disease in fish in aquaria and probably also occurs in marine fish. In the initial stage, diagnosis is difficult. Later, nodules and ulcers appear [tissues affected not stated in abstract]; exophthalmos, blindness, loss of scales and dyspnoea occur.—J. ZWEIG.

HEILMAN, D. H., & SEIBERT, F. B. (1946.) The effect of purified fractions of tuberculin on tuberculin-sensitive tissue. Quantitative studies in tissue cultures.—*Amer. Rev. Tuberc.* 53. 71-82. [Spanish summary.] 13

In this paper the authors give a detailed description of their use of quantitative tissue culture methods in observing the relative toxicity of derivatives of the tubercle bacillus for cells of normal and tuberculous animals. The reader is referred to the original paper for these details. Their results showed that P.P.D. in varying concentrations had in all instances a specific toxic action in cultures of explants from tuberculous rabbits. Normal macrophages were not inhibited by P.P.D. except in cultures containing 30 µg. per ml. or more. A broad quantitative relation existed between the degree of inhibition of migration of sensitive cells and the concentration of P.P.D. employed. On the other hand the tuberculin polysaccharide was equally toxic for normal and tuberculin sensitive cells. It was also shown that relatively large amounts of tuberculin nucleic acid could be added to tissue cultures without injuring either normal or tuberculin-sensitive cells.

These experiments illustrate both the biological importance of the protein derivative of tuberculin and the lack of specificity of the purified polysaccharide and nucleic acid fractions.

—W. R. KERR.

MENENDEZ, F. J. (1946.) Tuberculin PPD. A single intermediate dosage used in surveying 8,000 patients.—*Amer. Rev. Tuberc.* 53. 566-569. [Spanish summary.] 14

In a systematic study of tuberculin reactions in man, M. found that 0.00125 mg. is the dose of P.P.D. tuberculin sufficiently strong to reveal the greatest number of tuberculin-positive cases without producing unduly severe cutaneous or systemic reactions. Dilute solutions stored at low temperature retain their potency for at least seven weeks.—R. E. GLOVER.

WEGEMER, E., & BUESING, K. H. (1942.) Die Blutbactericidie und der Blutascorbinsäurespiegel im jahreszeitlichen Verlauf bei Gesunden und Tuberkulosekranken. [Bactericidal power and ascorbic acid content of the blood in healthy and tuberculous human beings.]—*Beitr. Klin. Tuberk.* 98. 666-678. [Abst. from abst. in *Bull. Inst. Pasteur.* 42. 74.] 15

The ascorbic acid level in the blood of TB. patients is not related to the vitamin C content of the diet, the bactericidal action of the blood, or the progress of the disease.—M. C.

GRUBER, G. B. (1943.) Über das Vorkommen tuberkulöser Erkrankungen bei Gefolgschaftsmitgliedern pathologischer Institute. [The incidence of TB. as an occupational disease in institutes of pathology.]—*Reichsgesundheitsblatt.* 18. 673-678. 16

G. describes 65 cases of pulmonary TB. among workers in pathological institutes and discusses the dangers associated with the performance of P.M. examination, by which tuberculous infections, distinguished as wound, smear, droplet and dust infections, may be acquired. He emphasizes the increased danger in times of labour shortage, when staff are insufficiently trained and food is short. He recommends periodical examinations, including X-ray control, for all workers in the organizations concerned, and the elimination from the staff of tuberculous employees. The Institutes should arrange for protective clothing and other preventive measures.—E. KLIENEGER-NOBEL.

DE ASSIS, A. (1945.) Ensinaamentos de dezessete anos (1927-1944) de vacinação B.C.G. no Brasil. [Deductions from seventeen years' use of BCG vaccine in Brazil (human).]—*Hosp., Rio de J.* 27. 529-543. [Abst. in *Bull. Hyg., Lond.* 21. 20, copied *verbatim*. Signed: H. HAROLD SCOTT.] 17

Vaccination with BCG in Brazil was begun in August 1927, with material prepared locally from a strain acquired from Calmette in 1925. At first only the new-born in the Maternity Institution of Rio de Janeiro were given it orally in total dosage of 3 cgm. as recommended by Calmette. From July 1929, cultures of 24-25 days' growth were used and the dose doubled, three doses of 2 cgm.; later still, in 1939, three doses of 3 cgm. were given. From 1929 also, immunization by subcutaneous injection of non-allergic children in a preventorium on the Island of Paqueta was started; in 1934 oral vaccination was extended to scholars and adolescents the dose being 10 cgm. given fasting; finally, in 1937-38, intradermal inoculation of 0.1 mgm. was tried. Seeing that the culture was harmless, it was thought well to vaccinate children of non-tuberculous in addition to those of tuberculous families.

Altogether, up to December 1944, 161,152 have received it; 2,304 up to May 1929, when 3 cgm. were used, 950 between July and December 1929, when 6 cgm. were given. Of late years 18,000 to 19,000 have been vaccinated annually, that is more than half the children born in Rio de Janeiro (the numbers of births being 34,000-36,000 *per annum*). Figures for places outside Rio de Janeiro are not reliable. The knowledge acquired from the use of the vaccine is presented in a series of conclusions, of which the chief are :-

1. Intradermal injection of 0.1 mgm. results in a small nodule in a little more than half the cases; this may or may not suppurate or caseate, but produces tuberculin allergy from the third week. In 44.5 per cent. nothing perceptible follows, no nodule is formed and allergy is not provoked.

2. In tuberculous individuals in the ante-allergic phase, or in the tuberculized who have lost their allergy, the inoculation of 0.1 mgm. sets up intense nodular reaction and cutaneous tuberculin allergy within a week. The author names this state "infratuberculin allergy".

3. Administered subcutaneously in a dose of 0.1 mgm. to non-allergic children, it causes transient local reaction in 96 per cent., more intense in the others; in 92 per cent. allergy results, usually slight.

4. A living culture given in three doses of 2-3 cgm. *per os* to infants in the first ten days of life gives rise to allergy to tuberculin in the third week in 15 per cent. of cases, increasing to 83.9 per cent. in four months and to 84.7 per cent. in the sixth month. Thereafter it begins to fall; at the end of a year it is 65 per cent. and then in successive years 36.4, 29.7 and 19.4 per cent.

5. A single dose of 20 cgm. of living culture, administered orally to children over 6 months of age and on an empty stomach, confers allergy from the fourth week and increasing to the third month.

6. The same culture given orally in doses of 2 cgm. daily for 55 to 75 days to children from 4 to 11 years old causes no disturbance, but does not confer allergy at the time nor immediately after.

7. Individuals vaccinated with BCG orally once or more and remaining apparently non-allergic (not reacting to 1.0 cgm. by the Mantoux test), if reinoculated with 0.1 mgm. of dead culture, reveal in 76 per cent. of cases that they are in the infratuberculin allergic state.

8. Oral administration confers appreciable refractoriness to natural infection.

9. Oral administration to the new-born living with non-vaccinated brothers in 38 families in which there was tuberculosis showed evidence of

conferring protection. In families with tuberculous parents there were 48 children vaccinated and 53 not vaccinated. Among the former there were 10 cases mostly mild, and only one death, whereas among the latter there were 21 cases and 7 deaths.

10. No immediate relation could be made out between the degree of intensity of allergy provoked by the BCG and the degree of resistance to the tuberculous environment.

11. In those who had been vaccinated but had lost their allergy, revaccination with average doses of 5-20 cgm., orally or intradermally, caused a marked cutaneous reaction to tuberculin.

12. Persisting non-allergy to multiple revaccination with BCG is often seen in those living in a strongly tuberculous environment possibly because of repeated reinforcement of immunity and, at the same time, desensitization.

13. Conditions essential for protective oral vaccination are :- (1) Freshly prepared vaccine, 12-14 days at 37°C. (II) Large doses, 9-20 cgm. (III) Fluid vehicle of pH 7.1-7.3. (IV) Administration fasting and no food to be taken for at least half an hour afterwards.

14. As a more general anti-tuberculosis measure the vaccine should be much more widely used, for the newly-born, for adolescents and for adults.

ARONSON, J. D., & PALMER, C. E. (1946.) **Experience with BCG vaccine in the control of tuberculosis among North American Indians.**—*Publ. Hlth Rep., Wash.* 61. 802-820. [Authors' summary slightly amended.] 18

The present paper gives the results of a study, begun December 1935, on the effect of BCG vaccination on the incidence of tuberculosis among American Indians. The study group consisted of 3,007 persons, ages 1 to 20 years, who were selected from a larger group on the basis of a negative tuberculin reaction. BCG vaccine was given intracutaneously to 1,550 with 1,457 serving as controls. These persons were followed for 6 years with annual tuberculin tests and chest X-ray examinations.

Tests of the vaccinated and control groups as to age, amount of exposure to tuberculosis, and completeness of follow-up indicate that the two groups are comparable in these respects.

Results from the analysis of the records show that BCG vaccination is associated with marked protection against the development of tuberculosis as measured by mortality and morbidity experience of the two groups.

During the 6-year period, 60 deaths from all causes occurred among the 1,457 persons in the control group compared with 34 among 1,550 vaccinated. In terms of deaths per 1,000 person-

years, the death rates were 7.2 and 3.8, respectively. There were 28 deaths assigned to tuberculosis among the controls as compared with only 4 such deaths among the BCG group.

Including those that died from tuberculosis 48 cases were classified as having extrapulmonary tuberculosis or advanced pulmonary lesions among the controls while only 9 such cases were found among the vaccinated.

The comparison for total incidence, cases of all types and deaths, is that of 185 among the controls and 40 in the vaccinated. In terms of cases per 1,000 person-years, the rates were 24.3 and 4.7, respectively.

There is no evidence from the analysis that a diminution of immunity occurred with the passage of time after vaccination. On the contrary, indications were that the protection may be greater in the later than in the earlier years after vaccination.

The total incidence of cases among the controls was nearly constant for all age groups, while among the vaccinated there was a marked decrease in incidence with advancing age. The evidence is suggestive, although not conclusive, that BCG vaccination may be more effective in the older than the younger children.

Some variation in the effectiveness of the different lots of vaccine was noted. Lots 8, 9, and 10 appeared to afford much less protection than the others used.

ANON. (1946.) BCG vaccination against tuberculosis.—*Publ. Hlth Rep., Wash.* 61. 801-802. [Summary copied *verbatim*.] 19

The results of BCG vaccination reported in international medical literature have not been uniformly satisfactory, nor have they gained wide acceptance. Furthermore, there has been considerable variation in methods of application and in the population groups served. Careful review of the voluminous literature on the subject since the initial work of Calmette and Guérin in Paris in 1920 fails to reveal irrefutable evidence of the vaccine's effectiveness. Several of the studies in the Scandinavian countries and in South America suggest a relationship between vaccination and decreased incidence of the disease among children over a short period of time. Analysis of these researches, however, shows no valid statistical proof of long-time benefits.

Briefly, the advocates of BCG vaccination have formulated their rationale in this fashion: the virulence of bovine tuberculosis bacilli is first reduced by special cultural procedures; then the vaccine is introduced into tuberculin-negative infants and children. The introduction of these attenuated organisms initiates a benign and self-limiting infectious process which rather rapidly

produces a variable degree of resistance against virulent strains of bovine and human tubercle bacilli.

The opponents of BCG vaccination emphasize the dangers of such deliberate imposition of infection, no matter how benign, and insist that only infected persons get tuberculosis and, furthermore, that this induced infection does not give significant immunity. Indeed, this group asserts that persons who have been infected early in life are those who die from tuberculosis later in life.

Up to the present, the use of BCG has been limited in its application mostly to persons in areas of high tuberculosis mortality. The inadequacy or the complete absence of isolation facilities and other control measures in such places made it imperative that persons who were constantly subject to massive exposure to tuberculosis should have some means of protection. In the United States, however, the relative availability of sanatoria in many areas has minimized the need for an immunizing campaign, and epidemiological studies, particularly analyses by such scholars of public health as Wade Hampton Frost, raised pertinent questions as to the permanent value of vaccination against tuberculosis. These studies showed that cohorts of such high mortality years as 1880, 1890, 1900, and 1910 made up the highest point of the statistical curve of tuberculosis deaths in 1930.

In other words, those persons who apparently had the greatest exposure and, by implication, the highest infection rate in their early years, and yet survived, came to death from tuberculosis in middle age. It is recognised however, that the intensity and amount of this internal infection with virulent tubercle bacilli may well have been greater than the artificial and measured inoculation with attenuated organisms used in BCG vaccination. The total effect of the vaccine on tuberculosis must await the day when a reduction in morbidity and mortality can be precisely measured.

Although we are looking to chemotherapy for striking results in the future, it appears from the present study that the use of BCG vaccination should be seriously considered for limited protection of heavily exposed groups. Such practice should not interfere with or delay the search for a drug or antibiotic which will be effective against tuberculosis. When such a discovery is made, the synergistic effect of a practicable vaccine and a potent antibiotic could be explored, for the ultimate benefit of the innumerable contacts of the tuberculous population.

*NÈGRE, L., & BRETEY, J. (1941.) La vaccination antituberculeuse des animaux et de l'enfant par le BCG. administré au moyen de scarification cutanées. [BCG vaccination of animals

and children against TB. by cutaneous scarification.]—*Pr. méd.* pp. 814-816. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)* 144. 503.] 20

Vaccination by dermal scarification is at least as good as that by subcutaneous or intradermal inoculation, and much better than oral administration. The allergy produced is of long duration, lasting at least one and a half years.—J. ZWEIG.

SAENZ, A. (1941.) Pleurésie séro-fibrineuse consécutive à l'inoculation intrapéritonéale de bacilles tuberculeux ou saphrophytes acido-résistants morts, enrobés dans l'huile de vaseline. [Sero-fibrinous pleurisy produced by intraperitoneal injection of killed tubercle bacilli and acid-fast saphrophytes mixed with liquid paraffin.]—*C. R. Soc. Biol. Paris* 135. 108-111. 21

A sero-fibrinous pleurisy in g. pigs follows heavy intraperitoneal inoculation of living bovine or avian type tubercle bacilli. The reaction is inconstant with the human type, and is not produced by the eugonic bovine type. It was found that the reaction was produced when killed bovine eugonic type bacilli were inoculated in liquid paraffin. Control g. pigs inoculated with the same material in an aqueous solution had no pleural reaction. Six g. pigs inoculated with killed human type in liquid paraffin all had the serofibrinous pleural reaction, as did those inoculated with killed avian type bacilli in liquid paraffin. In animals inoculated with killed Johne's bacilli the reaction occurred to a less extent. Tuberculin was not found in any of the exudates.—S. J. GILBERT.

PETRIK, F. G. (1944-46.) Atypical acid-fast micro-organisms. I. Nucleic acid fraction.

II. Desoxyribonucleic acid content.—*J. Bact.* 48. 347-350, & 51. 539-545. [Author's summaries copied *verbatim*.] 22

I. The reaction obtained with the diphenylamine reagent of Dische presumably indicates that the nucleic acid content of four of the strains of atypical acid-fast bacilli is similar to that of tubercle bacilli and consists largely of desoxyribonucleic acid. The material from two other strains gave less color with the reagent, perhaps because of the dilution of the nucleic acid by impurities. It may be, however, that the nucleic acid content of these organisms is a mixture of desoxyribonucleic acid and ribonucleic acid similar to that of *Corynebacterium diphtheriae* which contains both uracil and thymine and is either a mixture of plant and animal types or a new type (Anderson, 1938). No blue color was obtained with the material from the remaining four strains, indicating the absence or a low content of desoxyribonucleic acid. It would appear that any

classification suggested for this varied group of microorganisms should include a determination of the nucleic acid content. This work is being continued employing larger quantities of material to determine quantitatively the types of nucleic acid present.

II. The desoxyribonucleic acid content of a number of strains of *Mycobacteria* was determined. It is probable that this type of nucleic acid will be found in all strains of this microorganism.

The reaction for pentose obtained with the orcinol reagent indicated that ribonucleic acid was also present in three of these strains.

The nucleic acid content of the two strains of *Mycobacterium phlei* studied was found to consist largely of the desoxyribose type, which differs from Coghill's finding of the ribose type.

The values of the nitrogen-phosphorus ratios are consistent with that required by theory for the tetranucleotide structure of nucleic acid.

The bond between nucleic acid and protein in mycobacterial nucleoprotein apparently is non-polar since it was necessary to treat the nucleoprotein with alkali before the nucleic acid could be precipitated free of protein.

SCHOOP, G., & GASSMANN, P. (1943.) Eine bakterielle Deckinfektion bei Schafen. [A bacterial venereal disease of sheep.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 264-265. 23

A venereal disease characterized by ulcerations of the genital mucosa was observed in sheep. Rams were affected more than ewes and when affected could not be used until the next breeding season. Recurrence of the condition was, however, noted in following seasons. Ewes became pregnant even though infected. From the diseased mucosa a small Gram-positive organism was cultured which was difficult to maintain in further passages. It resembled *Corynebacterium pyogenes* on the one hand and *Erysipelothrix* [= *Listeria*—see abst. 28 below] on the other. Local treatment of the condition was unsuccessful, but prontosil given subcutaneously expedited the cure.

—E. KLIENEGER-NOBEL.

I. WALL, S. (1943.) Om doseringen av rödsjukeserum för svin. [Dosage of swine erysipelas antiserum for swine.]—*Skand. VetTidskr.* 33. 449-456. [English summary.] 24

II. LEHNERT, E. (1943.) "Om doseringen av rödsjukeserum för svin", ett svar på S. Walls artikel med samma titel i denna tidskrift. [An answer to Wall's article on the dosage of swine erysipelas antiserum for swine.]—*Ibid.* 698-700. 25

III. WALL, S. (1943.) Replik. [Reply to the above.]—*Ibid.* 700-703. 26

IV. ÅGREN, E. (1943.) Erfarenheter från praxis om dosering av rödsjukserum för svin. [Practical experiences with choice of dose for swine erysipelas antiserum for swine.]—*Ibid.* 708-704. 27

I. W. questions the scientific basis for the general recommendations that swine erysipelas antiserum should be given in doses according to body weight. He quotes a number of experiments on pigs and laboratory animals which indicate that the dose required is not proportional to the body weight, and argues that an effective protective dose for swine of any age or size should be 2-5 ml. and that a curative dose should be 5-10 ml. repeated 1-2 days later. The effect of a prophylactic dose of antiserum wanes in four days and disappears in seven, so that a second dose, if considered advisable, should be given 4-5 days after the first.

The agglutination test should be used to detect carriers of infection and these should be killed. If this is not done in a herd it is necessary to immunize the pigs every year [as is the rule in Central Europe]. Such a general control plan is advocated for Sweden.

II & III. LEHNERT challenges WALL's conclusions mainly on the ground that the strain of *Erysipelothrix rhusiopathiae* used to infect his experimental animals was much less virulent than field strains. In his reply, WALL gives the virulence of his strains for white mice (0.000,01 mg. killed a 15 g. mouse in three days) and cites an experiment in which six pigs were given 100 ml. of a one-day-old culture intravenously. One month later, when they were given a "provocative" dose of 30 ml. of carbolized horse serum, five out of the six pigs died of swine erysipelas. He considers that latent infections are a feature of the disease in the field and such infections can flare up when the pig is subjected to adverse conditions. He considers that excessive doses of serum can cause resuscitation of a latent infection and states that a dose of 30 ml. of carbolized swine erysipelas immune serum can kill pigs instead of curing them.

IV. ÅGREN describes his experiences in practice. He used serum doses according to body weight until 1943, when a shortage of immune serum forced him to follow WALL's method and use smaller doses. Results were excellent.—J. E.

KERLIN, D. L., & GRAHAM, R. (1945.) Studies of listerellosis. VI. Isolation of *Listerella monocytogenes* from liver of pig.—*Proc. Soc. exp. Biol., N.Y.* 58. 351-352. [For previous parts, see *V.B.* 14. 149.] 28

A pig which had intermittent diarrhoea and failed to gain in weight, appeared listless and dull, but history and clinical symptoms failed to indicate

the nature of the illness. The authors isolated *Listeria monocytogenes* from the pig in which the only lesions were grey, match-head sized foci in the liver. There were no symptoms of involvement of the central nervous system.

[TOPLEY & WILSON (1946) consider *Listeria* to belong to the genus *Erysipelothrix*. The *Veterinary Bulletin* proposes to conform to this usage in the future.]—D. L. HUGHES.

POSTMA, C. (1941.) Mensenpest en tularaemie. [Human plague and tularaemia.]—*Tijdschr. Diergeneesk.* 68. 571-587. [English, French and German summaries.] [Abst. from English summary.] 29

P. discusses at some length the general epidemiology of tularaemia in Europe and makes some comparisons with *Pasteurella pestis* infection with regard to the function of rodents as intermediate hosts.

QUOTRUP, E. R., QUEEN, F. B., & MEROVKA, L. J. (1946.) An outbreak of pasteurellosis in wild ducks.—*J. Amer. vet. med. Ass.* 108. 94-100. 30

From the carcasses of wild ducks, which had died in great numbers, an organism was isolated which belonged to the *pasteurella* group, but which failed to conform exactly to any of the recognized types within this group.

Lesions found P.M. included extensive petechiation of the epicardium, gizzard and trachea and haemorrhages in the gastric and intestinal mucosa. The organisms, which were present in blood smears from all birds examined, were bipolar and Gram-negative, produced an abundant growth on glucose agar and blood agar, but none on McConkey's agar and were haemolytic. Although the optimum temperature for growth appeared to be 37°C., good growths were also obtained at 20°C. The organisms produced small amounts of indol, but no H₂S or NH₃ and were negative to the Voges-Proskauer test and to the methyl red test of Clark and Lubs. They were highly virulent to mice, guinea pigs, chickens and ducks and in the latter, under experimental circumstances, produced lesions typical of fowl cholera.

The authors were advised that the cultural differences between this strain and *Pasteurella aviseptica* (*Past. multocidum*) were not sufficient to justify its classification as a new species, but they claim that this paper represents the first authentic record of pasteurellosis in wild ducks.—J. C. B.

*DERLOGEA, H., SUHACI, I., & CARABASU, E. (1942.) Beobachtungen über Ferkelparatyphus. [Paratyphoid infection in young pigs.]—*Anal. zootech. Inst. Român.* 9. 29-64. [Abst. from

abst. in *Schweiz. Arch. Tierheilk.* 87. 193-194.] 31

Salmonella cholerae-suis var. *kunzendorf* was isolated from a wide-spread outbreak of paratyphoid in swine, in which the most affected breed was the Mangalita and there was 30% mortality; a type-specific bacteriophage facilitated its routine identification. Good results were obtained from treatment with stock vaccine (Bayer) and later an autovaccine (formolized broth culture) but sero-therapy failed.—J. ZWEIF.

BOIVIN, A. (1942.) Pouvoir vaccinant et structure antigénique des salmonella. [Immunizing properties of salmonella.]—*Rev. Immunol.* 7. 16-32. 32

B. discussed the antigenic structure of salmonella and the relationship of the "O" antigens to the virulence and immunogenic power of these organisms. Experimental data are given to prove that the glyco-lipoid antigens from different strains of *S. typhi-murium* do not differ greatly in their immunogenic powers, that the somatic antigen XII is immunogenic, and that the "O" and "Vi" antigens of *S. typhi* possess similar immunizing properties.

B. concludes that an intact antigen is sufficient for a high immunogenic power and that although necessary, it is, by itself, insufficient for a high virulence.—A. BUXTON.

MORGAN, H. R. (1945.) Active immunization with purified somatic antigens of *Eberthella typhosa*, *Salmonella paratyphi*, and *Salmonella schottmuelleri*.—*Amer. J. publ. Hlth.* 35. 614-620. 33

M. gives details of the immunizing properties in mice and man of a T.A.B. bacterial vaccine and of a vaccine prepared from purified somatic antigens.

The following advantages of the purified somatic antigen have been stressed: ease of preparation, standardization and concentration; increased immunogenic activity with decreased toxicity, and the elimination of immunologically inert bacterial substances.—A. BUXTON.

HAJNA, A. A., & PERRY, C. A. (1945.) *Salmonella* types isolated in Maryland between 1936 and 1943.—*J. Bact.* 49. 518. 34

Out of a total of 89 strains, the following types have been identified: *S. typhi-murium*, *S. paratyphi B*, *S. derby*, *S. montevidео*, *S. oranienburg*, *S. cholerae-suis*, *S. newport*, *S. oregon*, *S. panama*, *S. enteritidis*, *S. anatum*, *S. poona* and *S. hvittingfoss*.—A. BUXTON.

KAUFFMANN, F. (1941.) Über mehrere neue *Salmonella*-Typen. [Several new salmonella types.]—*Acta path. microbiol. scand.* 18. 351-366. [In German.] 35

In this paper, serological and cultural studies of several new salmonella types are recorded. They belong to salmonella A-, B-, C-, D-, E- and several other groups.

The matter given is essentially detail, a mass of reference material necessary for typing purposes. Full information cannot be given in an abstract.—E. KLIENEGER-NOBEL.

RANDALL, C. C., & BRUNER, D. W. (1945.) A new type *Salmonella*.—*J. Bact.* 49. 511. 36

The isolation of *S. canastel* (IX, XII . . . : Z29: 1, 3, 5 . . .) has been reported for the first time. Two strains were recovered from American soldiers in N. Africa.—A. BUXTON.

DURRELL, W. B. (1946.) Studies on pullorum disease using rapid antigens.—*Canad. J. comp. Med.* 10. 143-148. 37

Stained whole-blood type antigens were employed. The regular type antigen detected 92%, the variant type detected 78%, the commercial regular and variant mixed type detected 100% and the commercial regular type detected 86% of the total reacting birds. In only one bird was there evidence of any possible antigenic hypersensitivity. This bird was affected with leucosis and reacted to the mixed antigen. Male and female gonads were examined and *Salmonella pullorum* was recovered from 40.6%.—R. G.

DAVID, W. (1944.) Bact. London als Ursache eines Massensterbens von Entenküken. [*Salmonella london* infection in ducklings.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 82-83. 38

In one-day-old ducklings from a poultry farm an epidemic occurred with a 50% mortality rate. A bacterium was cultured from the liver, the yolk sac and the heart blood which was identified as *Salmonella london*. It is assumed that the epidemic was caused by an egg infection which was due to infected ovaries.—E. K.-N.

HINSHAW, W. R., & MCNEIL, E. (1943.) The use of the agglutination test in detecting *Salmonella typhimurium* carriers in turkey flocks.—*Proc. 47th ann. Meet. U.S. Live Stk Sanit. Ass.*, 1943. pp. 106-121. 39

The authors stress the importance of *S. typhimurium* as a cause of mortality among turkey poults. Over 150,000 agglutination tests were carried out on several flocks of turkeys during the investigation. From these results the authors recommend that tube aggl. tests be carried out with both somatic and flagellar antigens and that a dilution of 1:25 is the most satisfactory for routine diagnosis. *S. typhi-murium* was recovered from 80.9% of cultures taken from the intestines and from 16.7% of cultures taken from the reproductive organs of reactors at autopsy.

Owing to the ubiquitous nature of *S. typhi-murium* and to the difficulty of interpreting the aggl. tests, this method of control is of limited value. It is recommended that the test be carried out only on farms where there are complete histories of the flocks and where the farmer's co-operation will enable strict isolation of suspected carriers, improvement in farm hygiene, and the control of vermin and other potential carriers of *S. typhi-murium*.—A. BUXTON.

HUPKA, E. (1948.) Eine umfangreiche Fleischvergiftung durch Breslaubakterien. [Extensive "food poisoning" due to *Salmonella typhi-murium*.]—*Z. Fleisch- u. Milchhyg.* 53. 221-222. 40

H. describes a sudden outbreak of intestinal derangement in 185 human beings shortly after the consumption of horse meat sausage which had previously been stored in a warm larder. *Salmonella typhi-murium* was demonstrated in the faeces of the patients, as well as in the sausage and horse meat. The meat came from a horse which for ten days had a seriously bruised leg, as a result of which it was destroyed. The temperature had remained normal and there had been no other signs of illness. H. discusses whether in the circumstances a bacteriological examination should legally have been made; he concludes that its omission, though legal, was a mistake, as it is known that in an animal with impaired health, *Salmonella typhi-murium* can invade the body from the intestines.—E. KLIENEGER-NOBEL.

LINSERT, H., & SAARFELS, E. (1942.) Ein Intermediusstamm mit Antigenbeziehung zur Paratyphusgruppe. [An intermediate strain antigenically related to the paratyphoid group.]—*Dtsch. tierärztl. Wschr.* 50. 466-467. 41

The authors isolated from a duckling with hyaline muscle degeneration an intermediate strain with O- and H- antigens of the paratyphoid group. Sugars were not fermented, but the strain behaved serologically as *Salmonella abortus-equi*.—J. Z.

FAULDER, E. T. (1943.) Calfhood vaccination in New York.—*Proc. 46th ann. Meet. U.S. Live Stk sanit. Ass.*, 1942. pp. 120-123. 42

F. describes the progress made in New York State since the inception on September 12th, 1941, of the plan for the vaccination of calves with strain 19 *Br. abortus* at 4-8 months of age after being blood-tested. Annual tests are made of all herds operating under the plan. Since the plan commenced, 23,000 calves have been officially vaccinated and ear-tagged.—S. J. G.

I. SEELEMANN, M. (1944.) Bangbekämpfung und Sterilitätsbehandlung. [Control of brucellosis and treatment of sterility.]—*Dtsch. tier-*

ärztl. Wschr./Tierärztl. Rdsch. 52/50. 24-26. 43

II. WILLE. (1944.) Sterilität und Brucellosebekämpfung. Bemerkungen zu den Arbeiten von Ritter und von Seelemann. [Sterility and the control of bovine brucellosis. Remarks on the articles of Ritter and Seelemann.]—*Ibid.* 185-186. 44

III. SEELEMANN, M. (1944.) Grundsätzliches zur Abortus-Bang-Bekämpfung des Rindes. Gleichzeitig ein Beitrag zur Frage der saprophytären und infektiösen Bedeutung verschiedener Mikroorganismen. Bemerkungen zu der Arbeit von Wille (DTW./TR. 1944, 185). [Control of bovine brucellosis. Note concerning saprophytic and infective micro-organisms, à propos article by Wille.]—*Ibid.* 196-200. 45

I. In herds infected with *Brucella abortus* the main symptom is a catarrh of the uterus, followed by an endometritis which produces sterility in the cows. Both conditions arise in consequence of an infective abortion. Although S. is of opinion that treatment of these conditions is of importance, he disagrees with RITTER [see *V.B.* 16. 97] who holds that the treatment of sterility only may be able to eliminate brucellosis from the stock. According to S. the main sources of brucellosis are the infected pregnant animals which by their abortion spread an enormous number of bacteria in the stables or on the pastures. Infection takes place *per os* and soon the lymph nodes are involved. It is therefore of paramount importance to find and eliminate the spreaders of bacteria. Usually they can be detected by their relatively high blood serum and milk titres in the agglutination test and in the flocculation reaction with "Sachweh" extract. The elimination of carrier animals with high titres and the vaccination of young animals are the best preventive measures; treatment of sterility will not eliminate the infection. Sanitary measures are also necessary. S. holds that, according to his five years of experience, vaccination with living vaccines is a particularly promising measure if accompanied by frequent blood and milk tests and the elimination of animals with high titres. Further investigation is, however, necessary before we can be certain of the full success and absolute safety of the new vaccination methods.

II. In agreement with RITTER and in contrast to SEELEMANN, W. states that the methods of eliminating infected cows and of vaccinating young animals will not succeed in the prevention of infective abortion. He thinks that local immunity in the uterus may be important in preventing infection. He emphasizes that it is of equal importance to improve the feeding and housing conditions of pregnant animals.

III. S. considers that RITTER and WILLE underrate the dangers of infection with *Brucella abortus* and believe that by raising the resistance of the stock, and by improving the conditions of feeding and hygiene, abortion and sterility could be prevented. The elimination of the primary cause, viz, the bacteria, must be the main aim of the farmers. As prophylactic measures he advocates elimination of carriers and vaccination of young animals. Experiments carried out on these lines for six years proved very promising.

—E. KLIENEBERGER-NOBEL.

SCHOOP, G., & ALTAG, N. (1944.) Agglutininbildung nach Impfung mit Abortus-Bang-Gallekultur-Impfstoff. [Production of agglutinins after inoculation with bile culture of *Br. abortus*.]—*Dtsch. tierärztl. Wschr. /Tierärztl. Rdsch.* 52/50. 157-158. 46

In experiments carried out on g. pigs and cattle on the titre and duration of agglutinin reactions after inoculation with "bile culture", the titres varied greatly. In cattle, they fluctuated between 1:50 and 1:3,200, but usually they remained low and diminished rapidly. The conclusion is drawn that when positive titres are found in cattle three months or later after vaccination they result from spontaneous infection.

—E. KLIENEBERGER-NOBEL.

*SZALAY, I. (1942.) [Detection of brucella in cow's milk.]—*Inaug. Diss., Budapest.* pp. 20. [Abst. from abst. in *Berl. Münch. Tierärztl. Wschr. /Wien. tierärztl. Mschr.* March 3rd. 79. (1944).] 47

It is stated that the rapid agglutination test with the *Brucella abortus* test paste manufactured by the *Behringwerke* is more reliable for the detection of brucella in milk than is g. pig inoculation or microscopic examination, using the Kolowsky staining method.—J. ZWEIG.

RATTI, P. (1944.) Über die Impfung mit Stamm Buck 19 gegen Abortus Bang; Immunisierung von Jungtieren. I. Bericht. [Inoculation with strain 19 against *Brucella abortus*; calf-hood vaccination. I.]—*Schweiz. Arch. Tierheilk.* 86. 297-299. 48

A severe outbreak of contagious abortion occurred in a herd of about 70 cattle. The young calves were inoculated with strain 19, and the successful results of their first pregnancies are recorded in tabular form. This was the first year for a long time in which no abortions had occurred among heifers on this farm. Serum from six of the other cattle had strong positive agglutination titres. The herd bull had to be destroyed because of a severe *Brucella abortus* infection, characterized by orchitis, fever, polyarthritis and endocarditis.

—E. COTCHIN.

AGIUS, E. (1945.) The prevention of human brucella infection in Malta.—*Arch. Inst. Pasteur Algér.* 23. 93-97. [In English.] 49

A. considers the fall in the number of cases of brucellosis in Valetta to be due to the pasteurization of goats' milk; the "holder" method is used. No other goats' milk may be used in Valetta. During the war there was a general decrease in the number of goats in Malta owing to slaughter for food and the spread of foot and mouth disease. Although fewer cases of brucellosis occurred in the island there was no fall in virulence of the organism and the mortality rate remained the same.—S. J. GILBERT.

BÖNNIMANN, R. (1944.) Beitrag zur Kenntnis der Gasbranderkrankungen des Rindes in der Schweiz. [Gangrene diseases of cattle in Switzerland.]—*Schweiz. Arch. Tierheilk.* 86. 403-421. 50

B. examined bacteriologically for aerobic and anaerobic organisms material received from practitioners from 97 cases of suspected gas-gangrene in bovines. Several methods of isolation were used: culture on Zeissler's glucose-blood-agar plate with 0.2%-0.3% cysteine added was quick and reliable in cases of mixed infection, incubation for 12-16 hours giving well-developed colonies. The benzidine plate of Gordon and McLeod also gave good results. G. pig immunity and pathogenicity tests were used in identifying doubtful strains.

In group one, comprising 48 animals dead or slaughtered without previously observed illness, clostridia were recovered from 32. *Clostridium chauvoei* was recovered from 12 (in pure culture from seven), *Cl. septicum* from 20 (from 15 in pure culture), *Cl. welchii* from five (from one in pure culture), *Cl. sporogenes* from two (in mixed culture) and *Cl. oedematiens* in pure culture from one.

In group two, consisting of 33 puerperal cases, clostridia were present in 25: *Cl. septicum* was recovered from all (22 times in pure culture), *Cl. welchii* from one, *Cl. sporogenes* from one and an unidentified apathogenic anaerobic bacillus from one.

Of the 16 cases of non-puerperal gas-gangrene in group three, clostridia were present in nine. *Cl. septicum* was recovered from all, in pure culture in seven cases.

The aerobic organisms isolated from the other cases included streptococci, diplococci and *Bacterium coli*. The streptococci were probably of some pathogenic importance.—E. COTCHIN.

TURNER, A. W., & EALES, C. E. (1943.) Studies on the *Clostridium oedematiens* group. I. "H" and "O" antigenic analysis.—*Aust. J. exp. Biol. med. Sci.* 21. 79-88. 51

"H" and "O" antigenic analysis was carried out on a representative collection of 33 strains, comprising five classed in the Scott-Turner-Vawter classification as *Cl. oedematiens* Type A, 22 classed as Type B and six classed as Type C, as well as two strains of *Cl. haemolyticum*. The results show that these strains share two "O" antigens in various proportions. Twenty strains of *Cl. oedematiens* ("black disease" type), *Bacillus gigas* (braxy type) and *B. gigas* (type) "osteomyelitis bacillosa bubalorum" from different animal hosts formed a homogeneous "H" group. The other strains examined did not share "H" antigens.—N. WICKHAM.

EPPS, H. M. R. (1945.) Studies on bacterial amino-acid decarboxylases. 4. *l*(-)-Histidine decarboxylase from *Cl. welchii* type A.—*Biochem. J.* 39. 42-46. 52

Acetone extracts and enzyme preparations from *Clostridium welchii* specifically decarboxylate *l*(-) histidine converting it to histamine. The enzyme is inhibited by metallic salts (silver, mercury and lead) by hydroxylamine and potassium permanganate. No evidence was obtained that a coenzyme was involved.—E. BOYLAND.

GUILLAUMIE, M. (1942.) Quelques observations sur les propriétés hémolytiques des toxines *perfringens* et histolytique. Action de différents sérums et du sulfamide sur ces toxines. [Haemolytic properties of toxins of *Clostridium welchii* and *Cl. histolyticum*. Action of various sera and of sulphonamides on these toxins.]—*Ann. Inst. Pasteur.* 68. 84-89. 53

The haemolytic action of the toxin of *Cl. histolyticum* is lost when the toxin is kept at 2°C. for some weeks. When *Cl. welchii* antigens are injected into horses, antihaemolysins are produced which can neutralize the haemolytic action of *Cl. histolyticum* toxin. Even in high dosage sulphanilamide does not prevent the haemolytic action of *Cl. welchii* and *Cl. histolyticum* toxins.

—M. C.

TOMLINSON, W. J., & GROCOTT, R. G. (1945.) Canine histoplasmosis. A pathologic study of the three reported cases and the first case found in the Canal Zone.—*Amer. J. clin. Path.* 15. 501-507. 54

The fourth case of spontaneous canine infection with *Histoplasma capsulatum* is reported. The infection occurred in a spaniel which was a keen ratter, and was possibly acquired from mice or rats.

The mode of entry seems to be the gastrointestinal tract. The abdominal lymph nodes retain the infection early but may rupture, producing an intense peritoneal reaction. The main cellular reaction is reticulo-endothelial hyperplasia in the abdominal lymph nodes. Micro-

scopically there is extensive hyperplasia of the reticular cells of the lymph nodes and destruction of the cortical lymphoid nodules. In the liver there is degeneration probably caused by toxic substances from the micro-organisms.—J. M. R.

AYGÜN, S. (1943.) Experimentelle Studien über Pleuropneumonia contagiosa caprae. [Experimental studies of contagious pleuro-pneumonia of goats.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 139. 55

A. claims to have established that the cause of contagious pleuro-pneumonia of goats in Anatolia [Turkey] is an ultravirus which is associated with a small organism resembling the influenza bacillus. Under adverse climatic conditions the bacillus gains the ascendancy and complicates the disease picture. In this stage of chronic disease the animal carries the virus for six months, if it lives so long. As in human influenza a mottled pleuro-pneumonia occurs, principally in the right lung, with an involvement of the connective tissues. It is suggested that the disease be called goat influenza. It is stated that it was also established that the Angora goat can be infected with human influenza.—U. F. R.

JENNISON, M. W. (1945.) Bacterial collagenase.—*J. Bact.* 50. 369-370. 56

The proteolytic activities of bacteria are usually examined in media containing gelatin, a hydrolytic product of collagen. J. found, contrary to the general view, that several species of bacteria which split gelatin are not able to attack collagen. Therefore he suggests that the name collagenase be reserved for the collagen-splitting enzymes. Of the aerobes tested, *Bacillus brevis*, *B. mycoides* and *B. mesentericus* produced collagenase, while of the anaerobes examined, *Clostridium histolyticum*, *Cl. lentoputrescens*, *Cl. sporogenes* and *Cl. bifermentans* produced this enzyme in varying degrees.—E. KLIENEBERGER-NOBEL.

AVERY, O. T., MACLEOD, C. M., & MCCARTY, M. (1944.) Studies on the chemical nature of the substance inducing transformation of pneumococcal Types. I. Induction of transformation by a desoxyribonucleic acid fraction isolated from pneumococcus Type III.—*J. exp. Med.* 79. 137-157. 57

MCCARTY, M., & AVERY, O. T. (1946.) Studies on the chemical nature of the substance inducing transformation of pneumococcal Types. II. Effect of desoxyribonuclease on the biological activity of the transforming substance. III. An improved method for the isolation of the transforming substance and its application to pneumococcus Types II, III, and VI.—*Ibid.* 83. 89-96 & 97-104. 58

[Authors' summaries copied verbatim.]

I. From Type III pneumococci a biologically active fraction has been isolated in highly purified form which in exceedingly minute amounts is capable under appropriate cultural conditions of inducing the transformation of unencapsulated R variants of *Pneumococcus* Type II into fully encapsulated cells of the same specific type as that of the heat-killed microorganisms from which the inducing material was recovered. Methods for the isolation and purification of the active transforming material are described.

The data obtained by chemical, enzymatic, and serological analyses together with the results of preliminary studies by electrophoresis, ultracentrifugation, and ultraviolet spectroscopy indicate that, within the limits of the methods, the active fraction contains no demonstrable protein, unbound lipid, or serologically reactive polysaccharide and consists principally, if not solely, of a highly polymerized, viscous form of desoxyribonucleic acid.

Evidence is presented that the chemically induced alterations in cellular structure and function are predictable, type-specific, and transmissible in series. The various hypotheses that have been advanced concerning the nature of these changes are reviewed.

The evidence presented supports the belief that a nucleic acid of the desoxyribose type is the fundamental unit of the transforming principle of *Pneumococcus* Type III.

II. It has been shown that extremely minute amounts of purified preparations of desoxyribonuclease are capable of bringing about the complete and irreversible inactivation of the transforming substance of *Pneumococcus* Type III. The significance of the effect of the enzyme, and its bearing on the chemical nature of the transforming substance, together with certain considerations concerning the biological specificity of desoxyribonucleic acids in general, are discussed.

III. An improved method is outlined for the isolation and purification of the pneumococcal transforming substance. This method makes use

of the fact that citrate inhibits the destructive action of the enzyme, desoxyribonuclease, which is released together with the active material during lysis of the living bacterial cells. A fivefold greater yield of purified transforming agent is obtained by the present method than by the procedure previously described.

The specific transforming substance has been isolated from pneumococci of Types II and VI, in addition to Type III. In each instance the biologically active material has been found to consist of desoxyribonucleic acid.

LINDEGREN, C. C. (1942.) **Nuclear apparatus and sexual mechanism in a micrococcus.**—*Iowa St. Coll. J. Sci.* **16**, 307-318. **59**

L. considers that the stability of the hereditary characters of bacteria provides evidence for the view that chromosomal structures, essentially similar to those found in other living organisms, are probably responsible for the heredity and variability of bacteria. While admitting that bacterial variation may be cytoplasmic, he believes that a bacterial nucleus is the principal agent controlling heredity.

Photographs of diplococco-tetrads, stained with acetocarmine, demonstrate the structures described by L. as nuclei and chromosomes. An arrangement into a sexual cycle is based on the increase in size of the organisms, not on actual observation of growing bacteria. In the smallest forms, no internal structures can be seen, but as the size increases, a nucleus may be observed in each half of the diplococcus, subsequently spinning out to form a chromosome. These chromosomes pair, continue to elongate and condense into eight chromomeres. Larger cells containing 16 chromomeres indicate fission. In the next stage the cells contain reticulate nuclei. Eventually each of these nuclei forms two chromosomes, which separate at the first meiotic cell division and later the second cell division produces the macrotetrad. It is possible that this represents a very early evolutionary type of sexual mechanism.—ISOBEL W. JENNINGS.

See also absts. **83** (infectious rhinitis of pigs), **90** (staphylococcus anatoxin), **92** (electric current, effects on bacteria), **96** (tetanus toxins), **98** (arthropods transmitting bacteria), **116** (anthrax, swine erysipelas and swine pasteurellosis), **187-188** (antibiotics), **190** (iodine compounds as bactericides), **191** (disinfectants), **192** (treatment of mastitis), **193** (chemotherapy of TB.), **218** (bacteria in meats), **220** (tubercle bacilli in sewage), **221** (staphylococcal food poisoning), **222** (salmonella and food poisoning), **223** (bacteria in air), **226** (media for tubercle bacilli), **227** (bacterial growth), **255-256** (pleuro-pneumonia, bovine and caprine), **254-256** (TB. in Zebu cattle).

DISEASES CAUSED BY PROTOZOAN PARASITES

BURTT, E. (1946.) **Incubation of tsetse pupae: increased transmission-rate of *Trypanosoma rhodesiense* in *Glossina morsitans*.**—*Ann. trop. Med. Parasit.* **40**, 18-28. **60**

G. morsitans raised from pupae which had been incubated at 30°C. transmitted *T. rhodesiense* considerably more readily than did flies from

pupae reared at normal temperatures. Reference is made to a similar observation by VANDERPLANK concerning the transmissibility of *T. congolense* by *G. swynnertoni* and *G. morsitans*. With *G. morsitans* reared at normal temperatures and fed on blood-positive animals, failure in the transmission of *T. rhodesiense* was fairly frequent, but

in 110 experiments with incubated pupae not a single failure occurred. Infectivity also developed earlier in flies from incubated pupae. The increase in transmissibility was greater when the flies were fed on certain species of animals (e.g., monkeys) than on others (e.g., sheep), so some influence is exerted by the host of the trypanosome. In two experiments, flies from incubated pupae showed the unusually high infection rates of 12.5% and 17.6% when fed on a bush pig and on a man respectively. A considerable proportion of infected flies was not detected by dissection when a modification of the Lloyd-Johnson technique was used, and the feeding of individual flies on rats was found to be the most reliable method of detecting infection.—U. F. RICHARDSON.

FULTON, J. D., & LOURIE, E. M. (1946.) **The immunity of mice cured of trypanosome infections.**—*Ann. trop. Med. Parasit.* **40**. 1-9. 61

Working with strains of *T. rhodesiense* and *T. congolense* in mice, immunity was tested after cure of infection by treatment with diamidinodimethyl stilbene, or with reduced tryparsamide, the test inoculum being adjusted to contain 5,000-50,000 trypanosomes.

In 128 such-tests some degree of homologous immunity was apparently present in all but four instances. Absolute immunity to reinfection was demonstrated as late as 26 weeks for *T. rhodesiense* and 20 weeks for *T. congolense*. This is in contrast to the results of earlier workers, but may be accounted for by the variable stability of the antigenic composition of some trypanosome strains. Variation in antigenic composition may occur during maintenance by passage in mice, or on account of the ability of a strain with a labile antigenic structure to establish itself within the immune mouse by acquiring an altered antiserum-fast character. A comparison of tests for homologous immunity showed that the ratio of mice which resisted reinfection to those which became reinfected after a prolonged incubation period was 48:2 for *T. rhodesiense* and 38:24 for *T. congolense*, but *in vitro* trypanolysis tests indicated that the antibody content was greater for *T. congolense* than for *T. rhodesiense*. This suggests that the apparent breakdown of immunity should be attributed to the greater antigenic instability of *T. congolense* and not to deficient powers of immunity in the host. A particularly labile antigenic constitution may contribute to the difficulty of curing *T. congolense* infection in cattle and to the difficulty of producing a solid immunity.

Complete cross-immunity existed between a parent *T. rhodesiense* strain and its atoxyl-fast offspring, but not with its antrypol-fast offshoot. It is suggested that the atoxyl-fast relapse strain reverted to the parent type, but the antrypol-fast

strain retained its relapse character. Some cross-immunity between the parent and antrypol-fast strains appeared to occur after treatment with diamidinodimethyl stilbene, but this is ascribed to persistence of the drug.—U. F. RICHARDSON.

HARTRIDGE, V. B., & SCHNEIDER, M. D. (1946.)

Trypanosoma Equiperdum antigen for complement fixation. I. Preliminary report: Preparation and titration.—*J. Amer. vet. med. Ass.* **108**. 224-226. 62

A method is described of preparing a dourine antigen from the blood of rats infected with *T. equiperdum*. Twelve infected rats yield on an average 100 ml. of material, which is sufficient for 5,000 tests, as against material for 500 tests yielded by the Watson method of antigen preparation. While there is a slight drop in titre, frozen antigen retains its potency for well over two months. The trypanosomes are collected by centrifugation of citrated, merthiolated blood at 2,500 r.p.m., the sediment being washed in distilled water, and are then resuspended in merthiolated buffer phosphate or merthiolated saline. The suspension is shaken with glass beads and frozen and thawed rapidly five times. Sediment is removed by centrifugation at 3,500 r.p.m. and the fluid is stored in the frozen state in vials containing 3 ml. It is concluded that the antigenic material of *T. equiperdum* is soluble in M/15 buffer phosphate, or in saline, each containing 1:5,000 merthiolate.—U. F. RICHARDSON.

PIERCE, A. E. (1946.) **Clinical observations on an experimental case of bovine trichomoniasis.**—*Vet. Rec.* **58**. 16-18. 63

Clinical observations are given on a two-year-old heifer inseminated and artificially infected with *Trichomonas foetus*. A composite graph indicates the character of the vaginal mucous membrane and the appearance and number of organisms as they were present in the discharges from day to day until abortion on the 85th day. The development of the serological and intradermal positive tests in this animal is also shown. P. stresses the importance of the appearance and disappearance of *T. foetus* in the discharges, the careful examination necessary to demonstrate sluggish and degenerate forms of the organism, and the relative periods for the development of positive reactions to the intradermal and agglutination tests.—W. R. KERR.

GLEISER, C. A., & YAGER, R. H. (1946.) **Trichomonad and Haemoproteus infections.**—*Bull. U.S. Army med. Dep.* **6**. 177-182. 64

Two cases are described of mixed infection with *Trichomonas gallinae* and *Haemoproteus columbae* in pigeons in an Army pigeon loft in Hawaii. The clinical and P.M. findings are

detailed. The pathogenic significance of the two parasites present was not definitely decided.

D.D.T. was used to destroy lice and pigeon flies in the pigeon loft.—M. C.

HAAS, V. H., WILCOX, A., DAVIS, F. P., & EWING, F. M. (1946.) *Plasmodium gallinaceum* infection characterized by predominance of exo-erythrocytic forms.—*Publ. Hlth Rep., Wash.* 61. 921-928. [Authors' summary copied *verbatim*.] 65

Certain chicks inoculated with sporozoites of *P. gallinaceum* either by mosquito bites or by injection of salivary glands developed fatal infections either before parasites appeared in their red blood cells or before erythrocytic parasites attained sufficient densities to account for the fatalities. Exo-erythrocytic forms of the parasite were found in the brains of these chicks at autopsy.

The exo-erythrocytic type of infection apparently represents a rapid reproduction on the part of the non-pigmented forms of the parasite to such an extent that they cause the death of the chick before the pigmented forms have time to attain appreciable densities.

Responses of this type appeared in 91 out of 104 chicks infected by mosquitoes which had acquired infection by feeding on chicks of the blood-inoculation passage series. They were seen in only 3 chicks out of 244 infected by mosquitoes of the chick-to-mosquito-to-chick passage series.

A similar type of infection was produced in chicks by inoculating them subcutaneously with emulsions of brains containing heavy infections with exo-erythrocytic forms, and in chick embryos by inoculating similar material into the yolk. Serial passage of the infection was twice accomplished through five consecutive groups of chicks, but could not be carried farther; passage through four consecutive series of embryos has been accomplished up to the time of writing.

There is at present considerable interest in the possibility that some phase of infection comparable to the exo-erythrocytic forms of *P. gallinaceum* (and certain other avian Plasmodia) may exist in the mammalian malaras. This report suggests a method for the search for comparable forms in the malaras of mammals.

PETROV, V. G. (1941.) Razvitie piroplazm *Babesiella bovis* v kleshchakh *Ixodes ricinus* L. i metod issledovaniya kleshchei na virusositol'stvo. [Development of *Babesia bovis* in *Ixodes ricinus*, with a method for detection of carrier ticks.].—*3rd Soveshch. parazit. Probl. [Ixodidae]*. pp. 29-31. [Only abst. given.] Moscow & Leningrad: Akademiya Nauk SSSR. 66

Organs of ticks taken from cattle naturally infected with *Babesia bovis* and from experimen-

tally infected animals were examined *in toto* and in sections for developmental stages of the parasite. Ticks which had been maintained for the two previous generations on insusceptible animals (rabbits) were used as controls. In each case, engorged females and their progeny for one entire generation were examined.

In ticks engorged on diseased animals, pairs of pear-shaped bodies were found in the ingested bovine red blood corpuscles, and also pear-shaped and amoeboid forms free of the corpuscles, lying in pairs with their blunt ends together, presenting the appearance of short worms. Such forms were also found in the gut wall. Rounded forms with a large nucleus were observed in the ovaries, and similar rounded forms and occasional masses of small forms were seen in the ova. In the larvae, nymphs and adults, rounded and oval forms with dividing nuclei and masses of small forms resembling small pointed worms were found in the body cavity, the gut, the muscles and in large numbers in the salivary glands.

From these findings, P. formulates a cycle of sporogony of *B. bovis* in the tick as follows. (1) The sexual forms of the parasite mature in the gut of the engorged female; later the gametes form zygotes which migrate through the gut wall to the ovaries and eggs, occasional zygotes being retained in the gut wall where they transform rapidly into sporoblasts and sporozoites. (2) In the eggs, some of the parasites round up, increase in size and form sporozoites; others remain as motile zygotes which migrate into the internal organs of the developing embryos, into the salivary glands of the larvae and later of the nymphs and adults. (3) In the salivary glands the parasites round up, increase in size and form sporoblasts, many of which form sporozoites as early as the larval stages, the remainder during the nymphal and adult stages.

P. also evolved a method for mass examination of ticks for piroplasms by examination of intact salivary glands stained by Feulgen's method. This represents a substantial saving of time, labour and materials, as compared with the preparation and examination of histological sections of the glands. Of 355 ticks collected from two pastures where piroplasmosis occurred annually in 10-40% of the cattle grazing there, sporozoites were found in 91 (25.6%). On pasture where the average incidence of the disease was two cases annually, only one infected tick (1.3%) was found, while no sporozoites were found in 180 ticks from a pasture where the disease did not occur. P. claims that the method offers a means of assessing with considerable accuracy the infectivity of a pasture for bovine piroplasmosis. At least 100 ticks should be examined from each pasture.—A. MOLDAWSKY.

STUART, R. D. (1946.) **Canine leptospirosis in Glasgow.**—*Vet. Rec.* 58. 181-182. 67

Of 101 dogs examined from the immediate neighbourhood of Glasgow, the majority being house dogs, 52 gave positive serological reactions for leptospirosis, 40% having a higher titre for *L. canicola* and 6% for *L. icterohaemorrhagiae*. The greatest number of positive sera came from male animals and animals over nine years old. Clinical details were received in only a few cases, but out of 11 animals in which nephritic symptoms were mentioned, ten were serologically positive for *L. canicola*. A high percentage of the sera from two greyhound kennels in which acute enteritis was occurring was positive for *L. icterohaemorrhagiae*; this might be due to the prevalence of rats in such kennels.

It is suggested that a considerable percentage of the chronic kidney disorders of older dogs originates in *L. canicola* infection.—U. F. R.

GSELL, O., & KANTER, U. (1945.) **Canicola-Fieber in der Schweiz.** (Menschliche Infektion mit *Leptospira canicola* bei Stuttgarter Hundeseuche.) [**Canicola - fever in Switzerland. (Human infection with *Leptospira canicola* from dogs with Stuttgart disease.)**]—*Schweiz. med. Wschr.* 75. 713-715. [Abst. in *Bull. Hyg., Lond.* 20. 733, copied *verbatim*. Signed: E. HINDLE.] 68

The authors describe a case of infection with *Leptospira canicola* in a veterinarian at Zurich, in the autumn of 1944, when there was an epidemic of Stuttgart disease amongst dogs, associated with the presence of *L. canicola*.

The patient showed an initial attack with high fever lasting 4 to 5 days, followed by two further attacks at intervals of about 10 days each. The general symptoms included myalgia, bradycardia, headache, stomatitis and conjunctivitis, sub-icterus and marked debilitation. The patient's serum agglutinated *L. canicola* in dilutions rising

from 1:8,000 2 months after the infection, to 1:64,000 after 6 months; falling to 1:2,000 after 9 months.

The patient had examined dogs suffering from Stuttgart disease during the course of an epidemic, when 114 cases of *canicola* infection were seen at the small animals clinic at Zurich during the year June 1944 to June 1945. The mortality among these dogs was 52 per cent. The sera of 75 of these dogs, including 25 of the fatal cases, were tested against various strains of *Leptospira*, including *icterohaemorrhagiae*, *canicola*, *grippotyphosa*, *sejroe*, *australis*, *Pomona*, and *autumnalis*. All 75 sera gave positive reactions against *L. canicola*; in addition some reacted with *L. icterohaemorrhagiae*, but less strongly. The examination of sera from 74 normal dogs gave uniformly negative results.

It is evident that *canicola* infection in dogs may occasionally be transmitted to human beings, but it seems to be rare and the clinical symptoms are those of a benign leptospirosis almost without icterus, but with a somewhat protracted duration.

HOFFMAN, H. A., JACKSON, T. W., & RUCKER, J. C. (1946.) **Spirochetosis in turkeys. (A preliminary report.)**—*J. Amer. vet. med. Ass.* 108. 329-332. 69

A spirochaetal infection of adult turkeys is recorded in California. The birds were lethargic and lost weight and many had diarrhoea, but the mortality was not high; as blackhead and fowl cholera were found to occur in the same flock, it is uncertain how far the spirochaete was responsible for the symptoms shown. The lesions were not striking, the liver and spleen being only slightly involved.

Although species of *Argas*, *Ornithodoros* and *Ixodes* occur in California, they were not detected on the premises concerned and the transmitting agent was not determined.—U. F. RICHARDSON.

See also absts. 194 (phenanthridinium 1553), 201 (protozoal infections and cancer), 230 (*Anaplasma centrale*), 231 (cultivation of trypanosomes), 255-257 (East Coast fever and trypanosomiasis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

*SPECT, F. (1943.) **Bemerkungen zur Maul- und Klauenseuche beim Menschen.** (Zur Arbeit von Dr. O. Scholl, Über zwei Fälle von Maul- und Klauenseuche usw. in Münch. med. Wschr. 1943, Nr. 4, S.71 u. 72.) [**Two cases of foot and mouth disease in human beings.**]—*Münch. med. Wschr.* pp. 168-169. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)* 144. 5.] [See also SCHOLL—*V. B.* 15. 76.] 70

The infection was characterized by numerous blisters in the region of the lips, palate, tongue and the tonsils, salivation, difficulty in swallowing,

and in one case by conjunctivitis. Sulphathiazole cured both cases, being more quickly effective when given intravenously than when given perorally.—J. ZWEIG.

CHUMAKOV, M. P. (1944.) **Izuchenie ul'travirusnykh entsefalitov.** Soobshchenie VI. **Pere-dacha virusa kleshchevovo entsefalita potomstvu u iksodovykh kleshchei i vopros o prirodnykh rezervuarakh etoi infektsii.** [**Virus encephalitis. VI. Transmission of the virus of tick-borne encephalitis to the progeny of *Ixodes*, and the**

question of natural reservoirs.]—*Med. Parazitol., Moscow*. 13. No. 6. 38-41. [Abst. in *Bull. Hyg., Lond.* 20. 723, copied *verbatim*.] [For parts IV & V, see *V. B.* 16. 300.] 71

Specimens of *Ixodes ricinus* infected with the virus of spring-summer encephalitis were collected in the field and fed at intervals on laboratory animals to determine the time of persistence of virus in the ticks. Virus was recovered from nymphs of the second generation 11 months after collection, from the second generation imago after 15 to 18 months, and from larvae and nymphs of the third generation after 22 to 26 months. Transmission of virus through the egg was also noted through three generations (two years after the original collection). Ticks can therefore act as a reservoir of virus as well as being vectors; they may indeed be the main reservoir, as virus can only be demonstrated in wild animals irregularly, and while they are being parasitized by ticks.

SMITH, M. G., BLATTNER, R. J., & HEYS, F. M. (1945.) Further isolation of St. Louis encephalitis virus; congenital transfer of virus in chicken mites (*Dermanyssus gallinae*).—*Proc. Soc. exp. Biol., N.Y.* 59. 136-138. 72

In confirmation of previous observations [see *V. B.* 16. 45] the virus of St. Louis encephalitis was isolated from chicken mites (*Dermanyssus gallinae*) collected from widely separated chicken houses. The virus was recovered by inoculating ground-up mites into mice and was identified by suitable protection tests with immune serum.

Unfed first-stage nymphs reared under artificial conditions carried the virus; moreover, infection was still present in a colony of mites maintained for seven months in the laboratory.

—R. E. GLOVER.

HAMMON, W. MCD., & REEVES, W. C. (1945.) Recent advances in the epidemiology of the arthropod-borne virus encephalitides. Including certain exotic types.—*Amer. J. publ. Hlth.* 35. 994-1004. 73

The virus of St. Louis Encephalitis has been isolated from eight "pools" of naturally infected *Culex tarsalis* mosquitoes in California, from *Culex pupiens* in Washington State and from *Aedes dorsalis* in California. *Culex* mosquitoes feed principally on fowls and it is supposed, but not yet proved, that fowls are an important epidemiological link in this disease. Virus has been detected in *Dermanyssus gallinae* by an independent group of workers [see preceding abst.].

The authors have frequently isolated the virus of equine encephalomyelitis, Western type, from *Culex tarsalis* and rarely from other species of mosquito. Fowls are easily infected and are suspected to be epidemiologically important,

especially as no case of infection passing from horse to mosquito is known.

There is little new to report about the virus of the Eastern type of E.E. It was found in Michigan and across the Canadian border in 1942.

The Venezuelan type of E.E. was discovered in Venezuela, Ecuador, Colombia and Trinidad. The possibility of fatal human infection with this virus was proved in 1943. The mosquito *Mansonia titillans* is known as a common vector.

Information is also given on Russian spring-summer encephalitis of man, Japanese "B" encephalitis and on two new viruses causing encephalitis in man, the West Nile virus and an unnamed virus or viruses, distinct from the above, in Texas and in the western states of the U.S.A.

—J. E.

HAMMON, W. MCD., REEVES, W. C., & GALINDO, P. (1945.) Epizootology of western equine type encephalomyelitis: eastern Nebraska field survey of 1943 with isolation of the virus from mosquitoes.—*Amer. J. vet. Res.* 6. 145-148. 74

In contrast to other areas in the U.S.A., where Western E.E. is epizootic, no antibodies against the virus were found in Nebraska in the blood sera of chickens, pheasants or rabbits. It appears, therefore, that the virus is probably adapted to some other hosts as yet undetected. Virus was isolated on one occasion from *Culex tarsalis* but not from other species of *Culex* in the area, or from *Aedes* (various sp.), *Anopheles punctipennis*, *Cimex lectularius*, etc.—R. E. GLOVER.

BRIÈRE, J. (1945.) Note sur l'affection nerveuse du cheval "appelée encéphalo-myéélite infectieuse". [A non-infectious disease of horses resembling equine infectious encephalomyelitis].—*Rec. Méd. vét.* 121. 50-52. 75

B. reports four isolated instances of horses with typical symptoms of infectious E.E., but which, on thorough investigation, seemed to result from some form of alimentary disturbance. B. draws attention to the fact that some conditions of purely digestive origin can result in a neuro-hepatic syndrome whose manifestations recall those of an encephalomyelitis and mentions that some interesting reports in the literature have been made on a certain number of so-called cases of infectious E.E. without affording definite proofs of the aetiology of the condition.—A. EDEN.

SCHLESINGER, R. W., OLITSKY, P. K., & MORGAN, I. M. (1944.) Induced resistance of the central nervous system to experimental infection with equine encephalomyelitis virus. III. Abortive infection with Western virus and subsequent interference with the action of heterologous

viruses.—*J. exp. Med.* 80. 197–211. [For previous parts, see *V. B.* 13. 319]. 76

Previous work by these and other authors indicated that the immunity of animals vaccinated against either Eastern or Western E.E. virus with formolized vaccine is specific to the vaccinating strain and that the degree of immunity shown by vaccinated mice corresponds to the titre of neutralizing antibody in the serum: studies on vaccinated rabbits have revealed, moreover, a constant ratio of the order 300:3:1 between the titres of antibody in serum, brain tissue and cerebrospinal fluid.

In this paper experiments are described which illustrate a type of resistance, following recovery from the disease, which does not appear to be specific either to Eastern or Western virus and in which neutralizing antibodies are not necessarily present.

Pooled sera, taken from g. pigs one week after they had been given subcutaneously three inoculations of 1 ml. of formolized Western E.E. virus, neutralized 10 L.D.₅₀ of the same virus and fixed complement in the presence of Western antigen, but not in the presence of Eastern or St. Louis antigens. Intracerebral inoculation after eight days with Eastern virus revealed the absence of any resistance to this virus.

G. pigs which had been vaccinated against Western virus and had subsequently received a challenge inoculation without ill-effect survived further inoculations with Eastern virus after two weeks, yet tests for the presence of neutralizing antibodies in their sera against this virus were negative. A similar resistance to the virus of vesicular stomatitis was found to be present in the same animals.

For 20–30 hours after the intracerebral injection of 1,000 M.L.D. of Western E.E. virus, vaccinated and unvaccinated g. pigs showed parallel elevations of temperature after which vaccinated animals recovered. Brain lesions were similar in both vaccinated and unvaccinated animals. About one week after the mild infection in vaccinated g. pigs there was an accumulation of neutralizing antibodies in the brain tissue.

—J. C. BUXTON.

RUCHMAN, I. (1946.) **The effect of nutritional deficiencies on the development of neutralizing antibodies and associated changes in cerebral resistance against the virus of western equine encephalomyelitis.**—*J. Immunol.* 53. 51–74. 77

A series of experiments was undertaken in mice to determine the effects of undernutrition and imbalance of certain food factors on the production of serum antibodies and of active immunity against western E.E. virus.

The animals were given normal or synthetic

diets and were immunized with formolized vaccine, the effect of which was assessed by serum-neutralization tests or by an intracerebral immunity test with graded amounts of living virus.

In the malnutrition experiments, mice were fed on sufficient "Purina dog chow" to maintain the weight at 20 g. It was found that the neutralization index of the serum was considerably less than that of the controls. In addition, the undernourished mice, although partially protected, were less resistant to a test dose of virus than the controls.

Mice on a synthetic diet containing optimum amounts of vitamin B complex behaved as controls on the normal diet. Removal of the whole B complex lowered the immune response, but a thiamine or riboflavin deficiency had no significant effect.

A reduction of either protein or carbohydrate resulted in some decline in cerebral immunity, while the effect on antibody production was more noticeable.—R. E. GLOVER.

*SOLOWJOW, W. D. (1940.) **[Aetiology of spring-summer encephalitis.]**—*Acta med., Moscow.* 3. 484. [Abst. from abst. in *Zbl. Bakt. I.* (Ref.). 144. 455.] 78

The virus of an endemic encephalitis in the Taiga region is transmissible by intracerebral inoculation into mice, in which it causes a typical encephalitic syndrome and is characterized by histological brain lesions like those seen in man. Mice are also infected by the intranasal, intraperitoneal and in large doses by the subcutaneous route. Monkeys, g. pigs and some wild rodents and birds are also susceptible. The virus can be cultivated in the developing chick embryo, thyroid extract or rabbit serum. Natural infection is transmitted by ticks. A high percentage of man and domestic animals in the Taiga region show positive blood titres without any previous clinical symptoms.—J. ZWEIF.

KING, N. (1942.) **[A preliminary study of prevention of rinderpest in Szechwan Province.]**—*J. Szechwan agric. Res. Sta.* 4. No. 6, 7 & 8. 45–65. 79

The history of rinderpest eradication in European and American countries is reviewed. It is pointed out that the disease, which is a grave threat to the cattle population in this part of China, manifests itself in intestinal, pulmonary, skin and athermal forms, the body temperature in the last form rarely exceeding 39°C.—S. J. CHU.

LEWIS, E. A. (1946.) **Nairobi sheep disease: the survival of the virus in the tick *Rhipicephalus appendiculatus*.**—*Parasitology.* 37. 55–59. 80

The virus of Nairobi sheep disease was found to survive in unfed adult *R. appendiculatus* for

periods up to 871 days, in unfed nymphs for at least 359 days and in larvae from infected females for 245 days. It is concluded that land infested with infected *R. appendiculatus* remains dangerous to sheep for more than the 18 months suggested by MONTGOMERY (1917), and in fact that the virus will survive as long as unfed infected ticks can persist.—U. F. RICHARDSON.

PLUMMER, P. J. G. (1946.) **Scrapie—a disease of sheep—a review of the literature.**—*Canad. J. comp. Med.* 10. 49–54. 81

This paper is a review of 12 reports published by various investigators during 1913–43. In four sheep affected with scrapie and examined by P., vacuoles were found in the medulla in every case, as were inclusion bodies, similar to those described by Stockman.—THOS. MOORE.

MAGNUS, H. (1943.) Beobachtungen an Schweinepestfällen. [Swine fever.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 349–350. 82

In the early summer of 1943, S.F. reappeared on 12 different premises in the Stendal district, Germany, most of the cases appearing to be unrelated to each other. The outbreak commenced on premises where deaths were diagnosed as due to “*Herztod*”. On six premises deaths due to S.F. followed shortly after inoculation of the pigs against swine erysipelas. On two of these premises, deaths presumably due to swine fever, but not diagnosed as such, had occurred before the inoculation; circumstances on the other four, however, made it improbable that the virus had been spread by shoes, clothing, syringes or contaminated inoculation material and it is possible that the inoculation caused a flare-up of a latent S.F. infection. The presence of carriers of the virus might be explained if “*Herztod*” is a manifestation of S.F.; when “*Herztod*” is diagnosed in a herd, the pigs ready for slaughter are disposed of, but younger pigs remain and may act as virus carriers; these may then be introduced into other herds which do not breed their own stock.—E. C.

PHILLIPS, C. E. (1946.) **Infectious rhinitis in swine (bull nose).**—*Canad. J. comp. Med.* 10. 33–41. [French summary.] 83

P. reports a highly infectious type of rhinitis which appears to have developed in recent years. A survey of 50 premises indicated that it was spread through the introduction of infected animals. Infection appears to occur shortly after birth and at 2–4 weeks of age symptoms are noticed, including sneezing, followed by wrinkling of the skin and in some cases distortion of the snout. An early chronic inflammation of the nasal mucosa precedes decalcification of the turbinates and ethmoid bones. The type of exudate is variable. Encephalitis occasionally occurs.

Corynebacterium pyogenes was the organism most consistently isolated. —*Pasteurella suis*, *Brucella bronchiseptica* and *Corynebacterium pyogenes* are considered as secondary invaders and the primary aetiological agent is believed to be a filtrable factor. For control it is suggested that breeding from infected sows be avoided and that sows farrow on clean premises. Weaned pigs are much less susceptible to the infection.—R. G.

LARSON, C. L., & OLSON, B. J. (1946.) **An epidemic of a severe pneumonitis in the Bayou region of Louisiana. VI. A comparative study of the viruses of lymphogranuloma venereum, psittacosis, and Louisiana pneumonitis.**—*Publ. Hlth Rep., Wash.* 61. 69–78. [For part V, see *V. B.* 16. 349.] 84

FITE, G. L., LARSON, C. L., & OLSON, B. J. (1946.) **An epidemic of a severe pneumonitis in the Bayou Region of Louisiana. VII. Histopathology in laboratory animals.**—*Ibid.* 1100–1115. 85

[Authors' summaries copied *verbatim*.]

VI. Louisiana pneumonitis virus may be differentiated from psittacosis and meningo-pneumonitis virus by its ability to produce fatal infections in guinea pigs inoculated intraperitoneally and in mice inoculated subcutaneously or intramuscularly.

VII. The virus of Louisiana pneumonitis produces extensive lesions in mice, guinea pigs, and cotton rats, following intraperitoneal inoculation. In albino rats and hamsters, lesions are produced by large doses of the infecting agent but the virus is infrequently lethal for these animals. Rice rats, muskrats, ferrets, deer mice, nutria, and rhesus monkeys are not susceptible to infection with this virus. The variation in the quality of the lesions produced in mice, guinea pigs, and cotton rats by the Louisiana pneumonitis virus must be considered one of its distinctive features. In mice infected intraperitoneally or intracerebrally the lesions produced are probably indistinguishable from those caused by the viruses of psittacosis and meningopneumonitis. In mice infected intranasally with Louisiana pneumonitis virus the resulting pneumonic process shows material differences from the lesions in mice similarly inoculated with the other agents. There is no bronchial involvement and no tendency toward interstitial spread of infection in the lungs of mice infected with the agent under study.

The infection in guinea pigs is characterized by extensive fibrinous thrombosis of capillaries and sinuses of the liver and spleen, with comparatively less cellular reaction than observed in the mouse.

An extensive plastic fibrinous peritonitis constitutes the chief alteration in cotton rats.

Comparatively trivial changes occur in the organs.

Animals intracerebrally inoculated show a dry meningitis with slight extension of the process into the superficial brain tissues along the blood vessels. Mice and guinea pigs infected intraperitoneally occasionally may show lesions in the brain similar to those occurring in guinea pigs infected with the rickettsia of typhus fever or spotted fever.

CURNEN, E. C., & HORSFALL, F. L., Jr. (1946.) *Studies on pneumonia virus of mice (PVM).*

III. Hemagglutination by the virus; the occurrence of combination between the virus and a tissue substance.—*J. exp. Med.* **83**, 105-132. [Authors' summary copied *verbatim*.] [For part II, see *V. B.* **16**, 349.] **86**

The cause for the phenomenon of hemagglutination with heated PVM suspensions has been sought. Evidence in wide variety indicates that the component responsible for hemagglutination is the virus particle itself. The virus is capable of combining with a substance present in lung tissue of certain mammalian host species susceptible to infection by PVM. The occurrence of such combination accounts for a number of unusual properties manifested by this pneumotropic virus.

MUNDEL, B., GEAR, J. H. S., & WILSON, D. (1946.) *Studies in poliomyelitis. IV. The distribution of the virus of poliomyelitis in a sewage purification works in Johannesburg.*—*S. Afr. med. J.* **20**, 336-338. [Authors' summary copied *verbatim*.] [For parts I & III, see *V. B.* **16**, 349.] **87**

In an investigation to determine its distribution in a sewage purification plant, the virus of poliomyelitis was detected in the raw sludge, the settled sewage, and the effluent from the humus

tanks. It was not detected in treated sludge that had undergone digestion for 30 days, nor in the final effluent after sand filtration. It was not detected in psychodid (sewage) flies from the sprinkler filter-beds, nor in the faecal droppings of European swallows hawking insects in the neighbourhood of the sewage works.

It is noted that, although no cases of frank paralysis had occurred in the area served by the sewage works for nearly two months, the virus of poliomyelitis was still present in the sewage. This finding indicates either that silent infections were still occurring, or that there is a non-human source of the virus. The available evidence favours the former view.

It is recalled that in many sewage works the effluent from the humus tanks, shown to be infected in this investigation, is used to irrigate lands on which vegetables and fruit are grown. The potential danger of eating such vegetables and fruit raw is noted and discussed.

SHEPARD, C. C., & WYCKOFF, R. W. G. (1946.) *The nature of the soluble antigen from typhus rickettsiae.*—*Publ. Hlth Rep., Wash.* **61**, 761-767. [Authors' summary copied *verbatim*.] **88**

From these observations it would appear that the so-called soluble antigen of typhus, and presumably of other rickettsiae, consists of submicroscopic particles of a capsular substance. This substance adheres to and partly envelops the organisms seen in a centrifugally purified rickettsial suspension. It is broken up, and in a sense emulsified, by treatment with warm ether. Micrographs of cold-extracted suspensions show that in them the capsular breakup has begun but has not progressed to the stage of freeing many droplets of the soluble antigen. These droplets are agglutinated by antityphus serum.

See also *absts.* **55** (caprine pleuro-pneumonia), **116** (rinderpest and swine fever control), **130** (distemper, nervous complications), **254-259** (rinderpest), **255** (East African swine fever).

IMMUNITY

RAMON, G., & RICHOU, R. (1941.) *Immunisations associées chez l'animal d'expérience, leur intérêt pratique et théorique. [Immunization of animals by simultaneous inoculation with several antigens.]*—*C. R. Soc. Biol. Paris.* **135**, 901-904. **89**

A sheep immunized against anthrax was inoculated with tetanus and diphtheria antitoxins and horse globulin, and a horse was inoculated with tetanus and diphtheria antitoxins, sheep serum, etc. The inoculations were made on several occasions and with the addition of tapioca, tannin, etc., to increase the antigenic response. The different antigens provoked the appearance of the corresponding antibodies, the details of

which will be published later. It is intended to use these sera for study by flocculation methods and to examine the distribution of the antibodies in the serum proteins.—S. J. GILBERT.

RICHOU, R. (1943.) *Essais d'immunisation des animaux par l'anatoxine staphylococcique associée à des agents chimiothérapiques. [Immunization by means of staphylococcal anatoxin and chemical substances.]*—*Rev. Immunol.* **8**, 46-56. **90**

A number of inert substances have now been used to stimulate the production of antibodies and immunity. R. describes a number of experiments in rabbits and horses to ascertain whether the

addition of various chemical substances increased the antitoxin titre to staphylococcus toxin. Of those used, only potassium iodide seemed to favour to some extent the development of immunity. On the other hand, none of the substances inhibited its production. It was found that staphylococcus antitoxin therapy could be used in conjunction with sulphonamides, but that there was no advantage in inoculating a mixture of the materials. Iodide of potassium caused strong local reaction. 2% alum mixed with staphylococcus anatoxin sometimes increased immunity considerably, and better results were obtained in the treatment of various staphylococcus infections of animals than when anatoxin was used alone [see RICHOU & HOLSTEIN—*V.B.* 15. 95 and 16. 203 & 253].—S. J. GILBERT.

WINKLER, A., & WESTPHAL, O. (1944.) Über den zeitlichen Verlauf der Antigen-Antikörper-Bindung. [The time factor in the antigen-antibody union.]—*Z. Immunforsch.* 105. 154-164. 91

The authors examined typhoid-immune serum and serum from typhus patients, using as antigens suspensions of typhoid bacteria (alive, O + H; heat-killed, O; formalin-killed, H) and of *Proteus* X19 organisms (fresh and dried). The serum dilutions were mixed with the antigens and the mixtures were centrifuged after periods of time varying between 5 and 120 min. Agglutination tests were performed on the supernatants to evaluate the decrease in antibody titres. They agreed with DREYER & DOUGLAS (1910) in finding that absorption is rapid during the first 15 min. and that equilibrium is reached in 60-90 min. The experiments with *Proteus* X19 and serum from typhus patients indicated that increases in the antigen concentrations do not appreciably alter the antibody titres of the supernatants. It was shown further that in the Weil-Felix reaction one part of the antigen absorbs two parts of the antibody over a wide range of concentrations.

—E. KLIENEBERGER-NOBEL.

NYROP, J. E. (1946.) A specific effect of high-frequency electric currents on biological objects. [Correspondence.]—*Nature, Lond.* 157. 51. 92

Systematic investigations of the effects of high frequency electric currents on biological material, apart from specific heating effects, have been accomplished by the use of a modulator by which the current is periodically turned on and off. This allows the heat produced to be so dissipated that the effects on the biological objects can be determined at temperatures below those at which specific heating effects can occur. The actual effect thus produced is entirely due to the electric field set up by the current. By the appli-

cation of known field strengths, cultures of *Bacterium coli* could be almost completely killed in a very short time and this action was independent of the temperature. Milk was sterilized by this technique and foot and mouth virus completely inactivated at a low temperature (not above 36°C.). Although a heat-inactivated virus can be used as a vaccine, the electrically inactivated virus has no vaccinating effect, emphasizing the differential effect upon the virus molecule. Moreover, by these high frequency electric currents, tissues were killed at temperatures not exceeding 30°C. It is possible to apply the technique to living tissue of entire animals, although suitable intervals must be allowed for the blood to carry away the heat. Effects are difficult to produce without skin injury and uniform treatment is hard to attain. An effect similar to that of the high frequency current has been obtained by several consecutive discharge couples, with suitable intervals for cooling, although up to the present it has been impossible to obtain such uniform treatment that a result comparable with that of the high frequency current is obtained.—A. EDEN.

MAIGNON, F. (1941.) Quelques faits de physiopathologie microbienne expliqués par la théorie fermentaire de l'immunité. [Certain facts of microbial physiopathology explained by the enzyme theory of immunity.]—*Rec. Méd. vét.* 117. 33-49. 93

M. presents an hypothesis to explain the various manifestations of the immune response of an animal to an antigen.

All immunity depends upon the fact when an antigen is inoculated parenterally into an animal, primary enzymes appear which break down the antigen into toxic products, to be removed or broken down in their turn into non-toxic substances by the secondary enzymes also produced. The primary enzymes are specific and for this reason persist for a long time in the circulation. The secondary enzymes are less specific and so may also deal with the products of normal protein metabolism; according to M., they may in this way be quickly removed from the circulation.

Immunity is acquired by the persistence in the animal of the secondary enzymes. Allergy or sensitization of an animal is due to the persistence of the primary enzymes in the body, with the disappearance of the secondary enzymes.

Immunity can only be produced by vaccination when the secondary enzymes persist for a long time. This state is brought about by the breakdown of bacterial antigens into toxic products totally estranged from the metabolic products of the animal body: the secondary enzymes pro-

duced to break down these toxic products are not used up in the normal metabolism of the body, but persist and give rise to immunity.

In the case of anaphylaxis, the animal possesses specific primary enzymes for the antigen, but no secondary enzymes. The anaphylatoxins are not very different chemically from the normal products of protein metabolism, except for their toxicity. As a result of this, the secondary enzymes disappear quickly from the circulation. When the shock dose of the antigen is given it is broken down by the primary enzymes into toxic polypeptides or decarboxylated histamine-like derivatives, which are only slowly removed as no secondary enzymes exist.

Allergy and the tuberculin reaction are explained along similar lines. M. surmises that in the case of the tuberculin reaction toxic tubercular products in the tuberculous animal are acted upon by secondary enzymes to form a lot of substance A and a little of B and their corresponding enzymes, while in tuberculin there exist a lot of B and a little A and by a reversal of enzyme action a resynthesis to toxic products occurs: these cause the actual reaction.

In antigen therapy the benefits are due to the stimulation of the production of secondary enzymes; possible dangers, such as the flare-up of the disease, would be due to the production of primary enzymes. As a result of this theory, certain lines of treatment which suggest themselves are being investigated.—R. R. A. COOMBS.

ANON. (1945.) Cold agglutinins.—*Brit. med. j.* Dec. 29th. 929. 94

A cold agglutinin is an agglutinin-like factor of serum, which at a low temperature (0.5°C.) acts in an apparently non-specific manner on human red cells and agglutinates them.

In a recent paper [see *V.B.* 16. 100] FINLAND *et al.* demonstrated the high titre of cold agglutinins found in the sera of many patients with primary atypical pneumonia. Cold agglutinins in a titre of 40 or higher were found in 137 or 68.5% of 200 characteristic cases of primary atypical pneumonia of unknown aetiology. Except in certain cases of haemolytic anaemia, trypanosomiasis and tropical eosinophilia, cold agglutinins are rarely found in such a high titre in other conditions. In the examinations carried out by Finland and his colleagues only 10 out of 851 sera from other conditions were shown to contain cold agglutinins at a titre of 40 or above.

The exact nature of cold agglutinins is still uncertain. Whether the responsible agent is an agglutinin or, in the case of primary atypical pneumonia, an haemagglutinating virus must be further investigated. The examination for cold agglutinins is, however, considered a useful

diagnostic aid in suspected cases of primary atypical pneumonia and in obscure cases of haemolytic anaemia.—R. R. A. COOMBS.

RAMON, G. (1943.) Sur les bases fondamentales de certaines méthodes modernes d'immunisation. Le principe des anatoxines et celui des facteurs adjuvants et stimulants de l'immunité. [Methods of immunization. Anatoxins and substances which stimulate antibody formation.] —*Rev. Immunol.* 8. 1-15. 95

R. reviews the flocculent reaction between diphtheria toxin and antitoxin, its application to the titration of antiserum and its extension to various other toxins and antitoxins. The subsequent addition of formol as a preservative led to the discovery of the value of anatoxins in the preparation of antisera for diphtheria and tetanus, and of venins, etc. The use of formol in virus vaccines is discussed, together with the use of adjuvant substances which stimulate immunity, such as tapioca, lanolin, agar, alum, etc., and the stimulation of immunity by simultaneous vaccination with various organisms.—S. J. GILBERT.

FRIEDEMANN, U., & HOLLANDER, A. (1943.) Studies on tetanal toxin. I. Qualitative differences among various toxins revealed by bioassays in different species and by different routes of injection. II. The antitoxin-requirements of tetanal toxin in the direct and indirect intraventricular tests.—*J. Immunol.* 47. 23-28 & 29-33. 96

I. Seven tetanus toxins were examined by intracerebral and intramuscular injection of rabbits and g. pigs and by intramuscular injection of mice. It was found that the potencies of all seven toxins varied according to the route of inoculation and that the relative potencies were different for each individual toxin. The authors concluded that toxins from various sources were not identical qualitatively.

II. The antitoxin requirements of seven tetanus toxins were investigated by intraventricular inoculations into rabbits and g. pigs. Two methods of inoculation were employed: either the toxin was inoculated immediately after the antitoxin had been injected intravenously (indirect test), or a mixture of toxin and antitoxin was injected into the intraventricular spaces of rabbits and g. pigs (direct test).

The indirect test in g. pigs and the direct test in rabbits showed qualitative differences between toxins derived from different strains. The direct test in g. pigs and the indirect test in rabbits did not reveal those qualitative differences.—A. B.

BERRY, L. J., DAVIS, J., & SPIES, T. D. (1945.) The relationship between diet and the mechanisms for defense against bacterial infections in rats.—*J. Lab. clin. Med.* 30. 684-694. 97

One hundred newly weaned rats were divided into ten groups, five male and five female, and one group of each sex was fed a basal diet of maize meal, and unenriched flour, pork fat and sugar in proportions approximating those eaten by families attending a hospital nutrition clinic. The remaining four groups of each sex received the basal diet, supplemented respectively with casein, casein and minerals, casein and vitamins, and casein, minerals and vitamins. Records were kept of the growth rate and measurements were made of the defence mechanisms against bacterial infections after periods of 61-146 days.

In rats on the basal diet there was a marked decrease after two months in the total leucocyte count and in all leucocyte elements. Differential counts showed a relative increase in granulocytes

See also absts. 1 (staphylococcus enterotoxin), 2 (natural aggln. of staphylococci), 9 (anavirulent alum vaccine), 13, 14 (tuberculin), 17-20 (BCG), 21 (tubercle bacilli in oil), 24-27 (swine erysipelas immunization), 31-33 (salmonella immunization), 42-46 (brucella vaccination), 61 (immunity to trypanosomes), 62 (complement-fixation test in trypanosomiasis), 63 (trichomonas agglutinins), 76, 77 (equine encephalomyelitis immunization), 86 (haemagglutination in murine pneumonitis), 88 (typhus antigens), 118 (allergy and hoven), 228 (adsorption of antibodies), 229 (complement fixation).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

BLANC, G., BALTAZARD, M., & MARTIN, L. A. (1945.) Contribution à l'étude du comportement des microbes pathogènes chez les insectes hématophages. Deuxième mémoire. [The behaviour of pathogenic bacilli in blood-sucking arthropods.] — *Arch. Inst. Pasteur Maroc.* 3. 51-73. 98

Newly emerged plague fleas (*Xenopsylla cheopis*) were allowed to engorge on mice inoculated with *Pasteurella aviseptica*. The mice died 24 hours after inoculation. Fleas became infected and organisms were recovered from them up to 54 hours after the last feed, but neither the inoculation of saline suspension of the triturated fleas nor the bite of the fleas themselves, even after as short a period as four hours after feeding, was infective to mice.

Similarly, fleas engorging on g. pigs inoculated with *Bacillus anthracis* in the septicaemic stage gave no transmission to fresh g. pigs by biting, but saline emulsions of triturated fleas inoculated into g. pigs caused their death within 48 hours, and the organism survived in the insect's body up to ten days after its last blood meal. No difference was noted with strain Delpy.

Bacteria recovered from fleas appeared degenerate and enlarged, with condensed protoplasm and poor staining powers, but a filtrate of extract of exposed fleas in Hartley broth did not retard the growth of the organisms *in vitro*.

—T. SPENCE.

BRUCE, W. G., & SHEELY, W. J. (1944.) *Screw-worms in Florida*.—*Bull. Fla agric. Ext. Serv.* No. 123. pp. 28. 99

The spread of *Cochliomyia americana* into Florida is traced from its first invasion in 1938,

and a relative decrease in lymphocytes in the same animals. Findings in rats on the fully supplemented diet were normal and in the other groups were intermediate between the two extremes.

Males and females on the basal diet had typhoid agglutination titres only 23 and 45% as high as those of the fully supplemented groups, with intermediate values of less than 50% for the partially supplemented groups. Measurements of the phagocyte activity gave results comparable with those for antibody production.

The results indicate that resistance to certain bacterial infections may be lowered by imperfect nutrition; this accords with work previously carried out on human patients. Malnutrition may thus be a factor in susceptibility to some though not necessarily every type of infection.—A. EDEN.

The bulletin contains good illustrative photographs and stresses the importance of early calving, dehorning, bloodless castration and careful gathering of cattle into yards free of projecting nails and snags, in avoiding injuries affording sites for oviposition of the fly. Ticks and dog-bites also provide wounds for infestation.

Best cures are achieved by swabbing wounds with a smear containing 7 parts diphenylamine, 7 parts benzol, 2 parts Turkey red oil and 4 parts lamp black.—T. SPENCE.

BOERO, J. J. (1945.) Los ixodideos de la republica Argentina. [Ixodidae in Argentina.]—*Rev. Med. vet., B. Aires.* 27. 1-10. 100

B. gives a classified list of the ticks found in Argentina, their animal hosts and distribution in the country. He also discusses the pathogenicity of the parasites for the animal hosts, and gives a list of diseases transmitted by them.—I. W. J.

STANBURY, J. B., & HUYCK, J. H. (1945.) *Tick paralysis: a critical review*.—*Medicine, Baltimore.* 24. 219-242. [Authors' discussion copied verbatim.] 101

The large number of cases reported in man and the striking symptomatology and uniformity of the clinical picture of these cases leaves little doubt that such a disease exists. Although there are constant differences between American and Australian cases, in general they are similar. The paucity of information about blood or spinal fluid findings or the pathological changes involved in these cases accounts for there being no laboratory diagnostic method. Diagnosis must be made on the basis of circumstance and the clinical findings. Errors in diagnosis have been made frequently,

but this is not to be unexpected. Neurological signs are regularly encountered in tick-borne Rocky Mountain spotted fever. Just why there should be differences between the American and Australian cases is not apparent. The striking difference is in the duration of the disease after the offending tick has been removed. In a few clinical reports symptoms persist to such a degree as to suggest that these cases might be bacterial or viral in nature.

There is also little doubt about the existence of a disease of domestic animals which resembles closely the pattern of the disease in man. Again, satisfactory means for objective diagnosis are lacking, and in many of the reported cases and epidemics it seems certain that an infectious disease was involved.

In contrast to the complexity of the etiology of tick paralysis is the simplicity of treatment. For the most part, either in man or in animals, this resolves itself into the removal of the tick. In human cases if bulbar signs are present more vigorous supportive measures, including the use of the Drinker respirator, may be resorted to. Hamilton's anti-tick dog serum has been given insufficient clinical trial to warrant critical opinion at the present time.

The cause of tick paralysis remains obscure. It is improbable that a specific bacterial, viral, or rickettsial agent is responsible, for transmission experiments using blood and macerated organs of ill animals have been uniformly unsuccessful, and, further, the remarkable subsidence of signs and symptoms following removal of the tick seems incompatible with an established parasite within the host.

The features of the disease are most readily explained by hypotheating a toxic agent formed in the tick and injected into the host. This toxin might be formed within the tick ova and diffused into the salivary glands, it might be formed within the salivary glands, or it might be formed elsewhere and activated by the salivary glands. The origin and nature of this toxin remain undisclosed despite the large amount of experimental work which has been done. The most convincing experiments are those which demonstrate a toxic agent within the egg.

Eaton noted the similarity of tick paralysis to coniine poisoning. He thought that the alkaline saliva might combine with tissue fatty acids, thereby displacing glycerin which could be acted on by any one of several saprophytic organisms with formation of butyric acid. Butyric acid in turn might combine with ammonia to form coniine. It is difficult to see how this necessarily complex

synthesis could take place. Woltmann in a discussion of Abbott's review also noted the similarity of tick paralysis to coniine poisoning. Since in tick paralysis peripheral neuromuscular function is intact it would seem unlikely that coniines or similar alkaloids could be involved. These act on myoneural junctions as well as on synapses.

McKay considered the mechanism of action of the toxin to be that of an antigen (sic) which increases the permeability of local blood vessels, with exudation of serum and pressure on the nerves. He thought the poison had a selective action also for the vagus center. There seems to be little support for this highly speculative point of view.

ANON. (1946.) **Tick paralysis.**—*Med. J. Aust.* March 9th. 339-340. 102

This annotation gives a brief review of tick paralysis, with special reference to that caused by *Ixodes holocyclus* in Australia. The note is based largely on the critical review by STANBURY *et al.* [see abst. preceding]. Certain differences between the syndromes seen in the U.S.A. and in Australia are discussed. There are references to the work of Ross [*V. B.* 6. 159] in Australia, which showed that the toxin responsible is contained in the salivary glands of *I. holocyclus* and that injection of material from the salivary glands produced typical paralysis in mice. Treatment and prophylaxis are not discussed.—H. MCL. GORDON.

GILL, D. A., MOULE, G. R., & RIEK, R. F. (1945.) **Trombidiosis of sheep in Queensland.**—*Aust. vet. J.* 21. 22-31. [Authors' summary copied *verbatim*.] 103

Trombidiosis of sheep in Queensland is due to infestation with the trombiculine mite, *Trombicula sarcina* (Wom., 1944), which causes acute local irritation followed by scab formation and secondary infection of the heels, fetlocks and shanks of sheep. The parasite also causes a condition in human beings known locally as "black soil itch".

The disease may affect most sheep in the flock over a period of two or three months. It is only seen in seasons when summer rains and temperatures favour the occurrence of the mite in very large numbers. Extensive lesions appear severe and repulsive but they are superficial and no deaths have been attributed to the disease. The mite appears to be associated with the black earths which occur in the Clermont-Springsure area and the grey kangaroo (*Macropus major*), which abounds on this country, is a natural host.

General particulars of trombiculine mites are given.

See also absts. 60 (glossina transmitting trypanosomes), 64 (pigeon flies), 66 (development of babesia in ticks), 71-74 (encephalomyelitis virus transmitted by arthropods), 80 (Nairobi sheep disease, transmission by ticks), 131 (parasites of deer), 148 (atmospheric humidity and arthropods), 195 (control of *Dermacentor albopictus*), 196, 197 (treatment of mange), 260 (D.D.T.).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

ASHBURN, L. L., PERRIN, T. L., BRADY, F. J., & LAWTON, A. H. (1945.) **Histologic changes in ovary and uterus of live *Dirofilaria immitis* recovered from dogs treated with trivalent antimony compounds.**—*Arch. Path.* 40. 334-339. [Authors' summary copied *verbatim*.] 104

Live adult females of *Dirofilaria immitis* recovered from 25 dogs treated with various trivalent antimony compounds were examined histologically mainly to determine the effect of the drug on the ovary and the uterine contents. Therapeutically active compounds produced striking changes in the ovary and the uterine contents

which in most cases agreed well with the microfilaria counts of the circulating blood. The changes were early degeneration or necrosis of ova and, in most worms, absence of microfilariasis. The uteri of some worms were entirely empty, and areas of necrosis were evident in the ovaries. Worms from 2 dogs treated with mercury compounds were normal. In view of these observations it is suggested that histologic examination of female worms recovered alive should be a part of any experimental study to determine the effectiveness of a chemotherapeutic agent.

See also absts. 131 (parasites of deer), 181, 182, 198-200, 213 (anthelmintics), 185 (toxicity of nematode-infested grass), 254-256 (cysticercosis).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

DRIEUX, H., & THIÉRY, G. (1945.) **Cancer mucipare primitif du poulmon chez un chien. [A case of primary mucoid carcinoma of the lung in a dog.]**—*Bull. Acad. vét. Fr.* 18. 276-283. 105

A rare neoplasm, a mucoid carcinoma, is reported in a ten-year-old dog. Symptoms included a cough, dyspnoea and emaciation. Tumours were found in the lungs (multiple), bronchial lymph nodes, the left kidney and the left iliac, sub-lumbar and sub-dorsal lymph nodes. The larger lung tumours had a necrotic centre. The growths consisted of branching, convoluted tubules, mucus being present in some but not in others. The tumour cells were cylindrical, with large nuclei containing 2-3 hypertrophied nucleoli. Mitoses were rare.

—JOHN G. CAMPBELL.

GREENE, H. S. N. (1944.) **Biological differentiation of benign and malignant growths.**—*Bull. N.Y. Acad. Med.* 20. 595-598. 106

Spontaneous cancers of the mammae and uterus of the rabbit develop in four stages, *viz.*, anaplasia, local tissue invasion, foreign tissue invasion and metastasis. Transplantation experiments, using the anterior chamber of the eye technique, have yielded positive results only with tumour tissue in the last two stages.

Tissue in the preliminary stages of neoplasia can be transplanted into rabbits already bearing spontaneous tumours and into normal rabbits to which oestrone has been administered, but it dies in normal untreated rabbits.

G. concludes that the constitutional status incident to an abnormal secretion of oestrone is one of the factors essential to the continued growth and development of tumours. The stage of foreign tissue invasion appears to mark the

attainment of autonomy of a tumour, and at this stage it is possible to grow rabbit and human tumours in the anterior chambers of foreign species.—JOHN G. CAMPBELL.

KIRSCHBAUM, A., & BITTNER, J. J. (1945.) **Relation of the milk influence to the carcinogenic induction of mammary cancer in mice.**—*Proc. Soc. exp. Biol., N.Y.* 58. 18-19. 107

Strain dba males were crossed with C3H females possessing the milk influence (Z stock) for mammary cancer and with C3H females lacking the milk influence (ZB stock). The F hybrid animals so obtained were observed as either virgin or forced-bred females during treatment with methylcholanthrene. Breeding females of the genetic constitution (ZB ♀ × dba ♂) ♀ × dba ♂ were also treated with methylcholanthrene and virgin females of the C3H stock were similarly treated. Results suggest that the incidence of carcinogen induced mammary cancer in strain dba females and in hybrid females (dba × C3H) was greatly reduced if the test animals were not permitted to breed.—JOHN G. CAMPBELL.

CARRUTHERS, C., & SUNTZEFF, V. (1946.) **Calcium, copper, and zinc in the epidermal carcinogenesis of mouse and man.**—*Cancer. Res.* 6. 296-297. [Authors' summary copied *verbatim*.] 108

The change in concentration of calcium, copper, and zinc in epidermal carcinogenesis in mouse and man is briefly outlined. These studies indicate that the process occurring in both species is similar, in that there are considerable decreases in the amounts of these metals when normal mouse epidermis is transformed into squamous cell carcinoma by methylcholanthrene, and when the content of these metals in normal human epidermis

and in human squamous cell carcinomas is compared.

BISCHOFF, F., & RUPP, J. J. (1946.) **The production of a carcinogenic agent in the degradation of cholesterol to progesterone.**—*Cancer Res.* 6. 403-409. [Authors' summary copied *verbatim*.] 109

Progesterone, under the conditions that inhibited mammary cancer formation in RIII mice, failed to do so in Marsh-Buffalo mice. Ovariectomized Marsh-Buffalo mice that received 10 mgm. of progesterone per mouse subcutaneously over a period of 6 months failed to develop mammary tumors. Three milligrams of progesterone administered subcutaneously, alone or in combination with 500 units of estrone, failed to effect development of the mammary glands in Marsh-Buffalo female mice.

Mice that received sesame oil containing crude progesterone contaminated with cholesterol, or containing the equivalent of crystalline cholesterol, developed oleomas at the site of injection. Crystalline cholesterol or progesterone under the same conditions was without influence. A crude synthetic progesterone made by the method of Spielman and Meyer resulted in a 32 per cent incidence of malignant tumors at the site of injection, compared with a 0 per cent incidence in controls and a 1 to 2 per cent incidence in the colony.

HUSEBY, R. A., & BITTNER, J. J. (1946.) **A comparative morphological study of the mammary glands with reference to the known factors influencing the development of mammary carcinoma in mice.**—*Cancer Res.* 6. 240-255. [Authors' summary copied *verbatim*.] 110

A histological study was made to correlate the architecture of the mouse mammary gland and the 3 "primary" factors required for spontaneous mammary carcinogenesis: an inherited susceptibility, quantitatively and/or qualitatively adequate hormonal stimulation, and the milk influence. For this investigation several low tumor lines of mice, each lacking a single, though different, "primary" factor, were selected and compared with suitable mice that possessed all 3 of these factors and thus had a high incidence of mammary cancer. In this way the effects of a lack of each factor could be determined individually, and the following points were established:

1. The presence of the milk influence *per se* does not alter the extent to which lateral buds occur along the larger ducts of the mammary gland.

2. In the present material, as well as in that previously reported by other authors, lateral budding is more extensive in virgin mice of

strains that possess the inherited hormonal influence than in those that lack this factor.

3. Precancerous nodules of alveolar hyperplasia occur frequently only in mice of high tumor groups and are very uncommon in those of low tumor lines, irrespective of which one of the "primary" factors is lacking. From this it is concluded that the same 3 factors that are etiologically important for the development of mammary cancer are necessary for the development of precancerous alveolar hyperplasia.

4. Areas composed of an overgrowth of fine ducts were encountered in the mammae of mice belonging to high tumor lines. These, in all probability, are also precancerous in nature, but because they occur with relative infrequency they cannot represent a very common source of malignant transformation.

5. Inflammatory nodules, consisting of some alveolar hyperplasia usually exhibiting squamous metaplasia of the glandular epithelium and a surrounding inflammatory reaction, did not appear to be precancerous in nature. These occur with equal frequency in low and high tumor strains, and no transitions between them and frank carcinoma could be demonstrated. Etiologic factors important for the development of this type of lesion could not be determined completely but pregnancy and/or lactation were found to favor their development.

WALLACE, E. W., WALLACE, H., & MILLS, C. A. (1945.) **Influence of environmental temperature upon the incidence and course of spontaneous tumors in spayed C3H mice.**—*Cancer Res.* 5. 47-49. 111

Spayed C3H mice were kept in three separate rooms at temperatures of 68°F., 79°F. and 91°F. respectively. They were placed in these rooms at two months of age, care being taken to ensure an even litter distribution. Tumours appeared earliest in mice kept at 68°F., then those kept at 79°F. and latest in those kept at 91°F. The difference in age at tumour appearance between the mice reared at 68°F. and those reared at 91°F. was more than twice that found for analogous groups of unsplayed virgin mice, investigated in a previous experiment, whilst the tumour incidence in spayed mice at 68°F. was 32% higher than that in mice at 91°F.; in unsplayed mice at the corresponding temperatures it was 44% higher.

It was further noted that in all groups of spayed mice the incidence was lower and the mean age group for tumour appearance was later than in analogous groups of unsplayed mice. The authors conclude that removal of the ovarian influence lessens the tendency to neoplasia, but probably does not interfere with the effect of environmental temperature.—JOHN G. CAMPBELL.

WICKWARE, A. B. (1946.) **The incidence of erythroleucosis following inoculation by various routes.**—*Canad. J. comp. Med.* 10. 74-81. 112

The strain of virus used was isolated in 1943 and has been passaged 19 times. The intravenous injection of nasal washings from infected birds infected eight of 15 chicks. Blood changes were apparent in 22 days. Intravenous transfusion into 584 chicks gave morbidity and mortality rates of 74 and 41% respectively. The average period of incubation was 25 days, with a maximum of 48 and minimum of ten. Intranasal and intra-ocular inoculation gave morbidity rates of 74 and 100%, with mortality of 24 and 0%, respectively. Intra-pharyngeal, intraocular, intramuscular and subcutaneous inoculations resulted in a morbidity of 40, 50, 10 and 50% and a mortality of 0, 0, 1.7 and 7% respectively. The average weight ratio of liver to carcass was 1 to 12.3 in affected birds and 1 to 39.3 in controls. Average weights of spleen were 7.3 g. in affected birds and 3.0 g. in controls. Two livers, in contrast to the usual findings, had diffuse lymphomatosis. No breed susceptibility was noted, but age of chicks was considered a possible factor. There was no evidence of the virus being egg-borne in 44 chicks hatched from pullets which had apparently recovered. Infection did not occur in any direct or indirect contact trials.—R. GWATKIN.

BALL, R. F. (1945.) **Two unusual neoplasms in the chicken iris.**—*Cornell Vet.* 35. 383-386. 113

The tumours occurred in single-comb White Leghorn birds. A haemangio-endothelioma developed in a 172-day-old pullet as a red blister-like growth extending from the outer third of the iris toward the pupil and into the anterior chamber. The growth was composed of multiple sinusoids varying in size from capillaries to large cavernous spaces, many of which contained blood. Endothelial cells lined these blood channels.

A tumour tentatively classed as a melanoma was found in the iris of a 774-day-old hen. It consisted of black, bleb-like patches covering about one third of the iris, some extending to the pupillary border. Histologically, the iris showed a moderate lymphocytic infiltration and numerous finger-like projections of the pars iridica retinae extending towards the anterior surface of the iris.

The cellular structure of this tissue did not resemble a neoplastic process, but B. concludes that the extent and invasiveness of the growth indicates a neoplastic condition.

—JOHN G. CAMPBELL.

BURMESTER, B. R., & NELSON, N. M. (1945.) **The effect of castration and sex hormones upon the incidence of lymphomatosis in chickens.**—*Poult. Sci.* 24. 509-515. 114

In previous observations [see *V. B.* 16. 107] the female was found to be more susceptible to lymphomatosis than the male. In the experiments now described, the effects of castration and implantation with diethylstilboestrol and testosterone propionate upon its incidence were studied in 368 chickens of both sexes.

Castrated males had a significantly higher incidence of lymphomatosis than normal males of the same breeding. Whilst ovariectomized females had a higher incidence of lymphomatosis than normal females the difference was not significant. Capons treated with female hormone had a lower incidence of lymphomatosis than untreated capons. Female hormones had no effect on the incidence of lymphomatosis in normal males. Males and capons treated with male hormone had a significantly lower incidence of lymphomatosis than untreated males and capons. The results indicate rather that male hormone increases resistance to lymphomatosis than that female hormone increases susceptibility.—F. D. ASPLIN.

PEACOCK, P. R. (1946.) **The etiology of fowl tumors.**—*Cancer Res.* 6. 311-328. [Author's summary copied *verbatim*.] 115

Experience in transmitting chemically induced fowl sarcomas during the period 1935 to 1945 is described. A new sarcoma, G.R.C.H. 15, induced with 1,2,5,6-dibenzanthracene and propagated serially in pedigree Brown Leghorn fowls of known genetic interrelationship, has, like earlier chemically induced sarcomas (G.R.C.H. 1 to 14), resisted all attempts to extract from it any infective causal virus.

Comparisons between sarcomas G.R.C.H. 1 to 15 and 3 virus sarcomas revealed slight but definite histological differences between the two groups. Analysis of 30 generations of serial passage of G.R.C.H. 15 sarcoma revealed a genetic basis for the resistance to tumor inoculation frequently encountered throughout these experiments. The seasonal variation in transmissibility previously reported for sarcomas G.R.C.H. 1 to 14 was also observed in the case of G.R.C.H. 15 sarcoma.

The classification of tumor extracts is discussed and a method of obtaining cell-free extracts by capillarity described. Typical results of irradiation of virus tumors and their extracts are described. Virus sarcomas show a tendency to recur in the margin of an irradiated area, differing in this respect from chemically induced fowl sarcomas and from transplantable mammalian sarcomas.

All the experimental results serve to emphasize the differences between our chemically induced fowl sarcomas and the virus sarcomas derived from fowls with spontaneous tumors and

leucoses. Assertions that causal viruses in chemically induced fowl sarcomas have been demonstrated are analyzed and discussed. Only one such tumor (sarcoma No. 9 of McIntosh and Selbie) can be accepted as a virus-transmissible sarcoma derived from a tar sarcoma of apparently similar histology. This tumor seems to resemble

See also absts. 201-202 (treatment of tumours).

closely the group of filtrable sarcomas of spontaneous origin.

A theoretical explanation of some apparently conflicting results is advanced, and the conclusion drawn that there is no reason to postulate a single virus or a group of closely allied viruses as the essential cause of all forms of cancer.

DISEASES, GENERAL

YEH, Y. S. (1942.) [Retrospect and prospect of preventive work of animal diseases in Szechwan Province.]—*J. Szechwan agric. Res. Sta.* 4. No. 6, 7 & 8. 34-45. 116

The preventive measures described were inaugurated with the establishment of the Bureau of Animal Welfare in March, 1936. In 1937, serum and vaccine against rinderpest were produced and in 1939 a corps was formed to carry out disease eradication.

The first outbreak of rinderpest occurred in 1936; it was believed to have been introduced from Kansu Province, north of Szechwan. It was found that the fair held twice yearly in both northern and southern districts, and at which a big exchange of cattle took place, was responsible for spreading the disease in the province. According to this report, rinderpest antiserum gave protection for only one month, while the organo-vaccine gave immunity for not longer than six months. In 1936, only 236 cattle were vaccinated, while in 1941, 9,512 were immunized by organo-vaccine.

Other diseases dealt with included anthrax, swine erysipelas, swine plague and swine fever. In 1936, only 201 pigs were vaccinated against swine fever, but in 1941, the number of pigs immunized reached 11,618.

To carry out the measures effectively and successfully in the future, co-operation among local government, farmers and field workers was necessary. The full text of the Act of Prevention of Enzootics of the Province is appended.—S. J. C.

MUNRO, S. S., & KOSIN, I. L. (1945.) Proof of the existence of pre-oviposital embryonic deaths in chickens and their bearing on the relation between "fertility" and hatchability.—*Canad. J. Res. Sect. D.* 23. 129-138. 117

A series of poor hatches resulting from low fertility and low hatchability in a number of White Leghorn pens provided material for cytological study. The eggs from these pens were first separated macroscopically into fertile and infertile, and yolks containing apparently infertile blastodiscs were fixed for sectioning. In all, more than 150 blastodiscs were sectioned and studied and

cytological details are presented in clear photomicrographs.

In investigating the cause of low fertility in pedigreed hens from certain pens, the existence of preferential mating in the breeding pens was proved by the fact that many previously sterile hens commenced to lay fertile eggs following artificial insemination with samples of semen collected from the resident male birds, the level of fertility in the experimental group being raised to that of the control lot. Some hens, however, continued to lay apparently infertile eggs which, when examined cytologically, showed signs of blastodermal development. Out of 21 eggs picked at random from a large sample, all macroscopically infertile and laid by these hens over a period of almost three months, evidence of arrested development (pre-oviposital death) was found in nine germ discs.

In previous studies by one of the authors, a correlation between specific gravity, hatchability and fertility was observed and it is assumed that the normal egg that gives rise to a chick is formed and ovulated at a time when the hen is physiologically normal. The physiologically subnormal hen, however, produces poor quality eggs that cannot support the developing embryo. Thus, shell quality is a mirror of internal egg quality, because both depend on the physiological state of the hen.

The existence of oviducal mortality, long suspected on the basis of theoretical consideration and now proved to be a fact, following cytological study of infertile hatching eggs, suggests re-examination of the present-day views regarding fertility in the domestic fowl.—A. B. WICKWARE.

KERR, W. R., & LAMONT, H. G. (1946.) Hoven—an expression of allergy?—*Vet. Rec.* 58. 6-7. 118

A tympanitic condition indistinguishable from hoven can be produced by introducing antigen prepared from *Trichomonas foetus* into the uterus of a cow sensitized to this parasite. Hoven may thus be an expression of allergy due to spasm of the unstriped muscle of the cardia. Adrenalin in doses of 3-5 ml. given subcutaneously relieves

the tympany in $\frac{1}{2}$ -1 hour whether it results from the injection of antigen, or from feeding on lush pasture. Atropine sulphate in doses of $\frac{1}{2}$ grain has also been used. A trochar and cannula is only necessary when cows are *in extremis*.

—W. H. PARKER.

KREYBERG, L. (1946.) **Tissue damage due to cold.**—*Lancet*. 250. 338-340. 119

This paper describes some of the changes taking place in tissues during progressive exposures to low temperature and during subsequent warming. Initial changes are purely a physiological adjustment to cold and not until after prolonged exposure does the reaction of the tissues become pathological. Rational treatment depends upon a knowledge of the extent of the damage done by the cold, with or without freezing of the tissues, of the damage caused secondarily by vascular reaction and upon whether post-exposure necrosis is direct, secondary or both.

Three types of pathological reaction in tissues are described, resulting from (1) short and moderate exposure to cold, followed by return to normal temperature, (2) freezing of the tissues twice and (3) protracted but moderate exposure, not involving freezing to ice, leading to severe tissue damage. The clinical picture in the first type is that of a first degree frost bite; longer or more severe exposure leads to blister formation and a much more severe reaction (second degree frost bite). These effects are considerably increased by exposure to light and heat. In the second type, a necrosis develops firstly by direct action of the cold, and secondarily as a result of vascular stasis. The third type forms the basis of such conditions as trench foot, life-boat foot, etc. and the damage caused is due to an acute, aseptic inflammation. K. regards the reaction to severe or prolonged cold as one to a single factor, acute aseptic inflammation caused by the lowered temperature, the freezing to ice and the deprivation of oxygen. Treatment based on empirical experiments is outlined.—A. EDEN.

SHORR, E., ZWEIFACH, B. W., & FURCHGOTT, R. F. (1945.) **On the occurrence, sites and modes of origin and destruction, of principles affecting the compensatory vascular mechanisms in experimental shock.**—*Science*. 102. 489-498. 120

Use of the exposed meso-appendix technique of Chambers and Zweifach showed that vascular reactions in experimental shock consist of two stages; an initial compensatory and a subsequent decompensatory phase. Factors responsible for these have been designated vaso-excitor material (VEM) and vaso-depressor material (VDM). The detailed experiments described have demonstrated that the production of both is stimulated

by reduced oxygen transport to the tissues and that VEM is produced by the kidney, VDM chiefly by the liver. The appearance of VDM later than VEM is attributed to the more efficient oxygen utilization of the liver. It is suggested that destruction of VEM prior to the onset of the decompensatory phase is associated with reduced renal flow, aerobic destruction by liver and kidney and limited anaerobic production by the kidney; in recovery from the decompensatory phase, if it occurs, VDM is destroyed by some specific liver function, probably enzymatic. The interrelationship of the factors is stressed. Therapeutic implications are discussed.—C. W. OTTAWAY.

COLE, C. R. (1946.) **Changes in the equine larynx associated with laryngeal hemiplegia.**—*Amer. J. vet. Res.* 7. 69-77. 121

The larynges of 174 horses were examined for evidence of anatomical changes associated with hemiplegia. 27% had signs of atrophy of the left intrinsic muscles and a table gives the percentage shown as determined by gross and microscopic examination of all muscles. Symptoms of hemiplegia had been observed *ante-mortem* in only 25% of cases with atrophy.

The crico-arytenoideus dorsalis (posticus), the muscle which dilates the vocal cords and opens the glottis, was most severely affected: over 50% atrophy of this muscle was noted in all cases with clinical symptoms of "roaring".

Microscopically, affected muscle fibres were reduced in diameter, there was elimination of part of the sarcoplasm and loss of cross striation, and, in extreme cases, degeneration with replacement by connective tissue.

Gross measurements of the recurrent laryngeal nerves of both sides are given. A diminution in size of the left nerve coincided with cases of muscular atrophy in the larynx. Microscopic changes were more common nearer the larynx and consisted of degeneration of the axis cylinders, loss of the myelin sheath and, in extreme cases, complete fibrosis of the nerve fibre.

A study of laryngeal movement was made by rhino-laryngoscopic examination and faradic stimulation—C. W. OTTAWAY.

TER BORG, H. (1941.) **Chronische maagdilatatatie bij een paard. [Chronic dilatation of the stomach in a horse.]**—*Tijdschr. Diergeneesk.* 68. 672-675. [English, French and German summaries. [Abst. from English summary.] 122

The author describes P.M. findings in a 13-year-old horse, with a history of colic. The animal was emaciated but had an enormous stomach, weighing with its contents 42.5 kg. The greater curvature measured 185 cm. and the lesser, 22 cm. The greatest width was 138 cm.

WALKER, K. M. (1945.) The diagnosis and treatment of male infertility.—*Proc. R. Soc. Med.* 38. 243-246. 123

In cases of human infertility semen should be examined for volume, quality, rate of liquefaction, proneness to agglutination, viability and motility of spermatozoa, and contamination with micro-organisms. The presence of a large number of abnormal forms of spermatozoa is unfavourable to conception. The importance of the count has been exaggerated. A negative post-coital test for cervical insemination may mean low viability or motility of spermatozoa or alteration in the cervical plug. Testicular biopsy under pentothal is a guide to the advisability of hormonal stimulation. All forms of chronic infection, genital or otherwise, should be treated. Fresh garlic infusions, or extracts containing the soluble alcohol and acetone fractions, have been used successfully to combat bacteria in semen. The advantages of sulphonamides outweigh the possible temporary adverse action on germinal epithelium. Methyl testosterone crystals, 1.5-3 mg. weekly, stimulate epididymal secretions and assist the maturing of sperm. Success with carefully graded X-ray radiation is reported. The results of surgical treatment are not good.

—E. F. MCCARTHY.

ANDRES, J. (1945.) Alte und neue Erkenntnisse über die Unfruchtbarkeit des weiblichen Rindes. [Infertility in the cow.]—*Schweiz. Arch. Tierheilk.* 87. 1-14. 124

This is a critical consideration on general lines of past and present views on the aetiology and treatment of bovine infertility.—E. COTCHIN.

BIETTI, M. V. (1945.) Renacimiento de las crianzas y el factor tropical en la esterilidad bovina. [Revival of cattle breeding and the effect of tropical climate in bovine sterility.]—*Rev. agric., Guatemala.* 1. 583-585. 125

This is a general article discussing the prospects of the cattle industry in Guatemala. Progress has been delayed owing to lack of financial credits, poor water supplies and the slow breeding of cows. Poor breeding performance has been ascribed to contagious abortion, but a survey of the country's cattle showed an infection rate of only 1.5%. In view of the ample sunshine and fresh pasture it is thought that lack of vitamins cannot be involved, though there may be mineral deficiencies. An investigation is called for.

—U. F. RICHARDSON.

HOFSTRA, H. (1943.) De chemische verhoudingen in den geboorteweg van het rund, in verband met puerperale infectie. [Chemical relations in the genital tract of the cow in con-

nexion with puerperal diseases.]—*Inaug. Diss., Utrecht.* pp. 130. [German summary.] 126

Experiments were made to determine the pH of amniotic and allantoic fluids and of vaginal mucus in the cow during various stages of pregnancy and also after parturition. The pH of amniotic and allantoic fluids was best determined by colorimetric methods and it was found that, while the pH of allantoic fluid was stable, there was a gradual increase of the pH of amniotic fluid from 7.14 at the 4th-5th months of pregnancy to 7.55 at normal calving. For the measurement of the pH in vaginal mucus, electrometric apparatus with a glass cathode gave the most satisfactory results. Storage of mucus at 4°C. for 1-8 hours did not affect the pH. The H-ion concentration of vaginal mucus was determined from samples from 62 animals and during varying periods of 90 to one days before calving, also for a period of a week after parturition. During the last three months of pregnancy the pH of the mucus varied irregularly between 6.53 and 7.96 (at 20°C.) and during the first week after parturition it was regularly found to be 7.34-7.37.

The composition of vaginal mucus appeared to be related to that of ox blood plasma. Dry matter and mineral constituents were similar in quantity to those of blood plasma although in a few cases the content of calcium and magnesium was found to be higher in vaginal mucus. An analysis of the glycogen content of the vaginal wall and the lactic acid content of vaginal mucus showed that these were present in very small quantities only. H. concludes that the buffering system of vaginal contents is similar to that of blood and it is not dependent on the lactic acid-lactate system. The buffering capacity of the vaginal contents would be $\frac{1}{3}$ - $\frac{1}{5}$ of that of blood and under certain conditions, such as parturition, can even be greater than that of blood. For the prevention of puerperal infection, H. suggests artificially reducing the pH of the vaginal mucus to a level of acidity unfavourable to the growth of coliform organisms. The application of douches of acid solutions had no lasting effect, but the object was achieved by continuous irrigation of the vagina by means of a special apparatus with an acid solution "rodesin", containing rhodan [i.e., the substance contains the -SCN radical and is a sulphocyanide].—B. WEITZ.

SCHUMANN. (1943.) Arbeiten über Aufzucht-krankheiten im Jahre 1942. [Publications on breeding diseases in 1942.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Oct. 1st. 342-344. 127

Recent literature on the subject is reviewed.

—J. ZWEIFG.

BERTHELON, M., & JUTEAU, J. (1946.) Un exemple de stérilité par anovulation chez la jument. [A case of sterility due to anovulation in a mare.]—*Rev. Méd. vét., Toulouse et Lyon*. 97. 14-17. 128

A case of sterility due to anovulation in a 12-year-old nulliparous mare, which was under daily observation during the breeding season, is described. During two months, four follicles developed at irregular intervals, three of these failed to complete their development and regressed without rupturing. In each case, the mare was served when the follicle was considered to be at its maximum size. The fourth follicle ruptured normally two days after service: the mare conceived to this service. During the season the mare was given four injections of gonadotropin in the form of pituitary extract ("isovulase"). The authors consider that this treatment was beneficial since in the previous year the mare had had similar symptoms but had not been treated and remained sterile. This type of anovulation is considered to be common in mares and must be distinguished from anovulation due to sclerosis of the ovaries. It is suspected by the presence of abnormally long oestrous periods and can be recognized by repeated ovarian examinations.

—ALFRED T. COWIE.

PENROSE, L. S. (1946.) Phenylketonuria a problem in eugenics.—*Lancet*. 250. 949-953. 129

While phenylketonuria, a condition in man due to a rare recessive gene in which the homozygotes excrete phenylpyruvic acid in the urine and are either imbeciles or idiots, is not of direct veterinary interest, there is much of value in P.'s discussion of its inheritance and of the possibilities of eliminating it from a population.

The homozygotes are seldom fertile so that they are not responsible for perpetuating the condition: nothing would be achieved by sterilizing them. The gene is maintained and perpetuated by the heterozygotes, who are estimated at about 1% of the population; at present no method by which they can be detected is known.

There is a two in three chance that the brother or sister of a homozygous individual will be a carrier. Unless such a carrier marries a cousin, the chances of his wife being also a carrier is about one in 100, and therefore the chance of a child of the union being affected is one in 600. P. questions whether it would be justifiable to prevent heterozygotes marrying. If some means of detecting them were available, then 1% of the population would be involved.

There are many defects in livestock which are due to the inheritance of a rare recessive gene. It would be practicable to prevent the use for breeding of known brothers and sisters of homo-

zygotes. In adopting such a practice it must be borne in mind (a) that unless they are mated to close relatives the chance of their producing affected offspring is remote and (b) that the practice would not eliminate the gene, or even greatly reduce its incidence in a given population. The elimination of a defect which is caused by the inheritance of a recessive gene can be accomplished by preventing consanguineous matings in affected families and ultimately by preventing the mating of carriers.

P. points out that, paradoxically, a decrease in the degree of inbreeding will actually tend to produce a slight increase in the abundance of carriers of rare recessive diseases.

Those concerned with the improvement of livestock will find the article provocative. The discussion of possible methods for the detection or recognition of heterozygotes is of special interest.—M. C.

WINSSER, J. (1940.) Een eigenaardige neurologische afwijking bij een jongen hond. [A peculiar neurologic condition in a young dog.]—*Tijdschr. Diergeneesk.* 67. 697-702. [English, French and German summaries.] 130

W. describes a case of injury to the nucleus ruber of a young Scottish terrier probably infected with distemper virus. The dog was affected after short walks with stiffness in the tail and extremities. A strange feature of the condition was that stiffness was absent when the dog's attention was concentrated on some activity, such as playing with a ball. Since it seemed possible that fluid which had infiltrated into the glial tissues could be absorbed and that the cerebrum could learn to control the walk reflex, prognosis was not unfavourable.—S. M. G.

COWAN, I. McT. (1946.) Parasites, diseases, injuries, and anomalies of the Columbian black-tailed deer, *Odocoileus hemionus columbianus* (Richardson), in British Columbia.—*Canad. J. Res. Sect. D*. 24. 71-103. 131

In 65 deer examined, 25 species of parasites (eight arthropods and 17 helminths) were recovered. Five species, *Cephenomyia jellisoni*, *Oesophagostomum venulosum*, *Dictyocaulus viviparus*, *Fascioloides magna* and *Nematodirus filicollis* were frequently found to cause fatal disease. Ten anomalous conditions described were not sufficiently frequent to be important in the life equation of the deer. Bacteria and viruses causing disease in deer were not studied.—P. J. G. P.

BALL, V., & GIRARD, H. (1942.) Kystes aériens congénitaux du poumon chez le chien. (Congenital air cyst of the lung, balloon cyst des Américains. Agénésie, hypoplasie lobaire des Allemands.) [Congenital air cyst of the lung in the dog.]—*Rec. Méd. vét.* 118. 5-12. 132

Macroscopic and microscopic findings are described in cases of congenital cyst formation in the right cardiac lobes of the lung of two dogs, aged two and eight months old respectively, which died suddenly, apparently from asphyxia. There was hypoplasia and aplasia of the lung parenchyma, together with imperfect development and dilatation of the bronchi.—E. COTCHIN.

PETIT, M. (1939-40.) Sur l'hyperplasie cément-euse. [*Hyperplasia of the cement of teeth.*]—*Rev. Méd. vét., Toulouse*. 91. 509-515. 133

The dental sac of the equine molar, which acts as a ligament with the periosteum, has a fixing layer of strong cement on the dental surface. This thins off towards the enamel coated portion but deeper down is very dense. When the crown is worn in old age, the cement is indurated and holds the roots together, rendering them still serviceable. This normal change, due to a mechanical stimulus from the roots as these undergo some movement, is compared with the great hyperplasia of the substance observed in a maxillary growth in a horse. The molar teeth involved underwent some remarkable changes, such as rotation and extrusion from the sockets and were held together by the dense cement which constituted a great part of the neoplasm and embraced spicules of bone. It is surmised that one loose molar set up the abnormal growth.—E. F. McC.

WYSSMANN, E. (1945.) Einige Beobachtungen über Vorhauterkrankungen beim Zuchstier. [*Disease of the prepuce in the bull.*]—*Schweiz. Arch. Tierheilk.* 87. 15-20. 134

Clinical descriptions are given of two cases of severe preputial injury in young bulls, one from barbed wire, the other due to the inexperienced use of an irritant solution in the treatment of preputial catarrh.—E. COTCHIN.

See also absts. 75 (equine encephalomyelitis), 82 (heart apoplexy of pigs), 101, 102 (tick paralysis), 103 (dermatitis in sheep), 142 (canine hysteria), 203 (canker in horses), 207 (choking in cattle), 210 (rheumatism), 211 (paralysis, post-parturient), 244 (diseases of laboratory animals), 253 (surgery of larynx in horses), 263 (skin diseases), 264 (trauma and disease).

NUTRITIONAL AND METABOLIC DISORDERS

LETARD. (1946.) Les déficiences alimentaires et leurs conséquences sur la productivité des animaux domestiques les répercussions sur l'alimentation humaine. [*Effect of war rationing on animal production.*]—*Rev. Path. comp.* 46. 147-157. 136

The effects of war conditions on the farm livestock population of France are considered with special references to the supply of milk and meat. Cattle in 1945 numbered about 18 million, as compared with over 15½ million in 1938. Sheep have decreased from ten million to six million, goats from 1,400 thousand to about one million.

Along with the decrease in numbers there

HIRSHFELD, J. W., ABBOTT, W. E., PILLING, M. A., HELLER, C. G., MEYER, F., WILLIAMS, H. H., RICHARDS, A. J., & OBI, R. (1945.) *Metabolic alterations following thermal burns. III. Effect of variations in food intake on nitrogen balance of burned patients.*—*Arch. Surg. Chicago*. 50. 194-200. [Abst. in *Bull. War Med.* 6. 15, slightly amended. Signed: G. R. CAMERON.] [For part II, see *V. B.* 16. 165.] 135

The nitrogen balance of 23 patients with burns of various parts of the body, amounting to 5-84 per cent. of the total body surface, was determined by comparing nitrogen intake with the nitrogen lost in the urine, faeces and vomit. The nitrogen lost in the exudate from the burn was also determined in 12 cases; it amounted to only a relatively small proportion of the total nitrogen output.

All the patients excreted large amounts of nitrogen in the urine, and, with the exception of a few who received abnormally large amounts of protein and carbohydrate, were in negative nitrogen balance and lost considerable weight. This negative balance could be prevented or decreased by giving the patients diets of high protein and caloric content. Such diets, however, were poorly tolerated during the first few days after burning, and nausea, vomiting, diarrhoea and mental confusion frequently resulted. It was not discovered whether these symptoms were the result of excessive amino acids, calories or water. During this period also, most patients showed a noticeable falling off in desire for food and, if left alone, failed to consume an adequate diet. It is important after the "shock" phase of burning has passed, to insist that they eat sufficient food to maintain proper nutrition.

has been a decrease in productivity and in quality.

The decrease in the total livestock of France is considered to be about 40%, as compared with 1938, a much greater decrease than occurred during the 1914-18 war. This great decrease is due to harvest losses as a result of military occupation, requisitioning by the occupying forces, blockade preventing import of oil cakes and cereals, shortage of farm labour, etc.—M. C.

KUO, F. C. (1942.) [Three years' work on the Nei-Kiang swine experimental station.]—*J. Szechwan agric. Res. Sta.* 4. No. 6, 7 & 8. 21-34. 137

The Experiment Station was concerned with the production of good stock animals and the conduction of experiments on nutrition.

A great improvement in livestock had been achieved since the introduction of the progeny test. Litter size was said to be increased from 8.7 to 11.9 in the Nei-Kiang breed and from 7.3 to 11.5 in the Yung-Chang breed. The percentage weaned increased from 7.5 to 9.9 in the former and from 6.4 to 9.0 in the latter.

An experiment was made to compare the nutritive value of cracked rice and maize fed as a concentrate to fatten pigs. Cracked rice was found to be slightly inferior to maize but because of its cheapness was still used. No advantage was obtained in cooking pig food; however, farmers still keep to the old practice. A demonstrative experiment was conducted by the Station, in an effort to persuade the farmers to abandon the old method. The daily increase of the body weight was shown to be 0.46 kg. for those given raw feed and 0.41 kg. for those given cooked feed.

The scum on the surface of sugar dried by heat in the sugar plant was commonly used by natives to fatten pigs. An experiment was made to compare its nutritive value with rape-seed cake, pea-nut cake and maize. It was found that the daily increase in body weight was 0.5 kg. for those fed with sugar scum, in comparison with 0.57 kg. for those fed with pea-nut cake, 0.45 kg. for those fed with rape-seed cake and 0.4 kg. for those fed with maize.

The Station was also offering loans to pig farmers, enforcing insurances for pigs and holding shows periodically for the instruction of farmers.

—S. J. CHU.

— (1944.) **Recommended nutrient allowances for domestic animals. Number I. Recommended nutrient allowances for poultry.** pp. 18. Washington, D.C.: National Research Council. 4to. 25 cents. 138

— (1944.) **Recommended nutrient allowances for animals. Number II. Recommended nutrient allowances for swine.** pp. 11. Washington, D.C.: National Research Council. 4to. 25 cents. 139

I. This is the first of a series of reports on nutrient allowances for farm animals, prepared by the Committee on Animal Nutrition of the National Research Council. The term "allowances" is used instead of requirements since the recommendations are meant to be of use under practical feeding conditions and a certain margin of safety has been allowed to cover variations in the composition of foodstuffs, the requirements of different breeds, etc.

This report deals only with allowances for hens and turkeys, since little information is avail-

able on the nutritional requirements of ducks. In addition to the allowances for the different essential nutrients, *viz*, proteins, minerals and vitamins, the average composition of individual foodstuffs is given together with formulae for rearing, laying and breeding mashers. The amount of food required for the production of meat and eggs is also given and a concise account of the symptoms of nutritional deficiencies is included, illustrated by some excellent photographs. These recommendations represent an expert interpretation of the present information on the nutritive requirements of poultry, but are not final and will be revised from time to time as new information becomes available. The report should be of great value to everyone interested in this branch of the livestock industry.

II. The exact nutritive requirements of swine are much less accurately known than are those of poultry; the allowances recommended in this report are therefore of necessity tentative pending the publication of further experimental data. They are considered adequate to prevent nutritional deficiencies under practical conditions, but no specific "safety margin" has been included. The recommended allowances for energy and protein, Ca, P, Na and K, vitamins A, D and B₁, riboflavin, nicotinic acid, pantothenic acid and pyridoxine are presented. Information is most complete in the case of growing animals; less is known, particularly of the requirements for the vitamins of the B complex, in the case of breeding animals. Some vitamins, such as vitamin E, and certain minerals, such as I₂, Mg, Mn and Zn are believed to be essential, but data on the quantitative requirements are lacking. A table giving the partial composition of the more commonly used foods is presented. The data include as far as possible those nutrients for which requirements are stated. Four types of diet, nutritionally adequate for the 100 lb. market pig, have been formulated, to illustrate the preparation of satisfactory rations from natural foodstuffs. The symptoms of various nutritional deficiencies are summarized in tabular form, but it is pointed out that those symptoms are not invariably specific and also that a nutritional deficiency may occasionally exist without the appearance of any definite symptoms.—E. M. CRUICKSHANK.

DUGAL, L. P., LEBLOND, C. P., & THÉRIEN, M. (1945.) **Resistance to extreme temperatures in connection with different diets.**—*Canad. J. Res. Sect. E.* 23. 244–258. 140

Rats offered a variety of foodstuffs were able to select a diet necessary for survival in good condition at normal (20°–25°C.), low (0° to –2°C.) and high (32°–35°C.) temperatures. At the low temperature one-quarter of the food consumed was

fat and one-quarter casein; the only animal consuming less of these substances died. At the high temperatures two-thirds of the food consumed was glucose and practically no fat was ingested. The salt intake was also greater, especially that of calcium lactate and monosodium phosphate.

A diet rich in fats is superior to one rich in carbohydrates in giving resistance to cold, providing both are equal in calories and vitamins, while for resistance to heat, a diet rich in carbohydrates and poor in fats is better.—P. J. G. P.

MORGAN, A..F., & GROODY, M. (1946.) **Further tests on a fit-producing dog food.**—*J. Amer. vet. med. Ass.* 108, 179-183. 141

A baked cereal commercial dog food, which had previously produced fits when fed to dogs [see *V. B.* 16, 169] was shown by rat growth tests to be deficient in protein. A dog which developed continuous fits after being fed exclusively on the fit-producing food for nine days was maintained in a normal healthy condition for 87 days by feeding it on the food to which fresh meat and fish were added before baking. There was no reduction in the wheat content of the diet which did not cause fits. It was considered that the wheat content did not alone produce the toxic effect. It is not stated whether the wheat flour used in the diet which did not cause fits was prepared in the same manner as that used in the diet which did. —H. WILLIAMS SMITH.

MELLANBY, E. (1946.) **Diet and canine hysteria.**

Experimental production by treated flour.—*Brit. med. J.* Dec. 14th. 885-887. 142

The nervous disorder known as "canine hysteria", "running fits" or "fright disease" has occurred in sporadic outbreaks in dogs during the past 20 years in Great Britain and in the U.S.A. In recent years the majority of writers seem to have agreed (1) that food was the causal agent, (2) that dog-biscuits and proprietary foods are often implicated, (3) that a wheat product is the most likely causal agent and (4) that excitement and physical strain influence the onset of attacks. HEWETON [*V. B.* 9, 643] also discussed the question.

In experiments by MELNICK & COWGILL (1937) convulsive reactions occurred in adult dogs fed gliadin as the sole protein in the diet. ARNOLD & ELVEHJEM [*V. B.* 10, 286] found that a "dog food" made of wheat flour and meat scrap processed by dry heat caused fits in young dogs, which could be prevented by adding to the ration a sufficient amount of unheated protein. Further work was done by WAGNER & ELVEHJEM (1944).

M. reports feeding experiments on dogs. Young dogs of the same litter were used and two

types of flour from the same grist were tested. One type had been "improved" and bleached by the "agene process", in which air saturated with water vapour and containing approximately 1% of nitrogen trichloride, NCl_3 , gas is brought into intimate contact with the flour in an agitator. This process is known to affect the gluten of flour. The other type of flour was untreated. The laboratory diet used was known to be adequate. When the cereal of the diet was untreated flour, no hysteria was observed, but it developed in dogs the cereal portion of whose diet was the agenzized flour.

Experimental data are summarized in three tables. Feeding on a diet in which there was substitution of the treated flour by the untreated type was followed by complete recovery from the hysteria and fits. Recovery from the slighter but more chronic form of the condition appears to have a relationship to the length of time the animals have received the treated flour. If they have had it for a long period, e.g., six months, recovery may not be complete even after 3-4 months on the untreated flour, although the most severe manifestations cease within 24-48 hours of the change of diet.

The results of the work now described reveal the toxic effect of agenzized flour: M. says that it would be of interest to know whether the gliadin and gluten used by the U.S.A. workers were prepared from agenzized flour. Proprietary dog-biscuits were said to be associated with canine hysteria. Although flour intended solely for dog-biscuits would not usually be subjected to an "improving" process, a long-extraction flour which had been so treated was, in fact, often used in the manufacture. It was considered that this fact supported the idea that agenzizing might well prove to be causally related to the observed hysterical attacks and account for the variations in reports implicating dog-biscuits. The abnormal behaviour of the affected animals may be the result of the effect on the central nervous system of some toxic agent formed by agenzizing the flour; other organs may also be involved. A few dogs have died in these attacks, but P.M. examination has not yet revealed any lesion which can be regarded as the essential one.—E. M. J.

BATE, W., ESPE, D., & CANNON, C. Y. (1946.) **Influence of homogenization of fat on haircoat of dairy calves.**—*J. Dairy Sci.* 29, 41-43. 143

Calves fed skim milk and unhomogenized soybean oil developed an alopecia of the perineal region which could be relieved by substituting homogenized soybean oil. This alopecia was not associated with any pruritus and disappeared as soon as the calves began to eat hay and grain and to ruminate. Alopecia of this nature could

not be produced in calves which had already commenced to ruminate.

No attempt is made to explain the phenomenon.—R. F. G. SANDERCOCK.

MILLS, C. A., COTTINGHAM, E., & MILLS, M. (1944.) **Environmental temperature and vitamin K deficiency.**—*Amer. J. Physiol.* **141.** 359–362. 144

It is shown that complete vitamin K deficiency in adult rats is much more severe in tropical heat than in temperate coolness. The haemorrhagic death rate was roughly four times higher in the heat and the retardation of clotting uniformly greater. The vitamin K requirement per gramme of food was twice as high for rats in the heat as for those in the cold. As little as 0.3 mg. of the vitamin per kg. of food protected against haemorrhage and death in either heat or cold, even when the diet included 0.5% sulphaguanidine. Complete prevention of prothrombin deficiency required about 1 mg. per kg.

Fatal haemorrhages in male rats on vitamin K-free diets were frequently found to occur in the genital system and around the superior mesenteric vein.—R. ALLCROFT.

SKINNER, J. T., & MCHARGUE, J. S. (1946.) **Experiments to ascertain the effect of manganese on the synthesis of ascorbic acid in the guinea pig.**—*Amer. J. Physiol.* **145.** 566–570. 145

Experiments were undertaken to ascertain the validity of the hypothesis of RUDRA (1939) that the inability of primates and the g. pig to synthesize vitamin C is due to insufficient Mn in the tissues of these species. RUDRA reported that g. pigs on a scorbutic diet were able to synthesize ascorbic acid when injected with mannose and Mn, but not mannose alone. The method of bioassay used in the present experiment was that of GOULD (1943), which depends on the concentration of serum phosphatase. This enzyme is low in scorbutic animals, and shows an increase on administration of substances containing ascorbic acid. It was found that the concentration of blood phosphatase decreased in scorbutic g. pigs injected with mannose solution, irrespective of whether the solution contained Mn or not. Livers of g. pigs injected with mannose and Mn contained the same amount of indophenol-reducing substances as those injected with mannose only. The results indicated that injected Mn does not promote synthesis of ascorbic acid in the g. pig.

—E. M. CRUICKSHANK.

REID, J. T., & SYKES, J. F. (1945.) **The influence of ascorbic acid on the activity of gonadotropic hormones in guinea pigs.**—*J. Nutrit.* **30.** 477–483. 146

The average weight of the ovaries of female rats on a vitamin C-deficient diet given injections of gonadotropin was 1.73 times greater than that of similarly deficient but non-injected animals. When vitamin C was added to the diet of females the gonadotropic effects were still further increased, the mean ovary weight being 1.38 times greater than in those receiving gonadotropin without vitamin C. Gonadotropin also increased the testis weight of vitamin C-depleted male rats to 1.81 times the weight of those not receiving the hormone, but the addition of vitamin C to the diet did not further increase the testis weight produced by gonadotropin alone.

Thus the effect of vitamin C in augmenting the utilization of gonadotropic hormone appears to differ with sex, and, as other workers have previously shown, with species.—A. EDEN.

COLE, H. H., HUFFMAN, C. F., KLEIBER, M., OLSON, T. M., & SCHALK, A. F. (1945.) **A review of bloat in ruminants.**—*J. Anim. Sci.* **4.** 183–236. 147

The authors give a comprehensive survey of the phenomenon of "bloat" in the ruminant, discussing its physiological, chemical and bacterial aspects and relating it to their own findings.

The various sections include:—(1) The sources of rumen gases: hydrogen, methane, CO₂, hydrogen sulphide and others; the problem of gas diffusion between rumen and blood and the permeability of the rumen wall. (2) The expulsion of gas from the rumen and the relation between the cardiac sphincter and rumino-reticular activity in eructation. (3) Factors influencing the rate and type of gas formation, e.g., type of food and the intervals between feeds. (4) The experimental production of bloat and a study of provocative and preventive diets; a short description of Dougherty's work on histamine produced bloat. (5) The prevention of bloat by feeding hay before pasturing. (6) The treatment of bloat by physical methods of relief such as the trochar, stomach tube and wooden bit. (7) A lengthy consideration of the theories of bloat causation, including those that it is due to excess gas, excessive food consumption, toxic gases, abnormal ruminal flora or to saponin present in clover, which causes the food mass to retain the gases. The theory that bloat may be due to an anaphylactoid type of sensitization is mentioned very briefly but is apt to be overlooked as it is included in the subsection dealing with experimental production of bloat by means of drugs. The treatment of the condition by injection of adrenalin is not mentioned.

The authors emphasize that the volume of gas eructed is the basic consideration and that any factors preventing it may induce bloat.—W. R. K.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

LUDWIG, D. (1945.) **The effects of atmospheric humidity on animal life.**—*Physiol. Zool.* 18. 103-135. 148

The paper reviews experimental work on invertebrates and lower vertebrates such as frogs: it does not deal with the higher vertebrates. Each species of arthropods has a range of humidities optimal for certain physiological processes. A table lists the optimal humidity for a number of arthropods at different stages of the life cycle and includes certain species of veterinary interest, such as *Ixodes ricinus*, *Lucilia sericata* and *Haematopinus asini*. The influence of relative humidity on the geographical distribution of organisms is discussed.—M. C.

SPEED, J. G., & MORRIS, P. G. D. (1946.) **The adrenals of the horse.**—*Vet. J.* 102. 27-36. 149

This article deals with the gross and microscopical appearance of the adrenal gland as evidenced by the examination of 18 Clydesdale and four cross-Clydesdale horses. Full details of the gross appearance at different ages are given and reference is made to nodular irregularities on the surface. In some cases these nodules were found to be loosely connected to the gland and superimposed one on the other; it is suggested, therefore, that on occasion they may become detached and be responsible for the discrete accessory adrenal bodies found in the perirenal fat.

Microscopic examination revealed the typical zonal distribution of cells, the cortex being separated from the medulla by an incomplete layer of connective tissue. An interesting record is the finding of a few small nerve cells in the medullary substance. Examination of the nodules revealed them to be composed of cortical tissue only; in the majority of cases completely encapsulated from the mass of the gland, in others, connected with the cortex by a column of contiguous cells. Accessory chromaffin tissue was found associated with the capsule.—C. W. OTTAWAY.

BARRETT, F. R. (1943.) **Studies in the deposition of lead in bone: 1. Calcification and lead deposition. 2. Calcium-phosphorus and lead-phosphorus ratios.**—*Med. J. Aust.* May 15th. 433-435, & Nov. 27th. 433-435. 150

1. In view of the known parallelism in the liberation of calcium and lead from bone, B. studied the relation of their deposition in newly weaned rats. By the fractionation of femora the deposition of lead was found to be twice as great in epiphyseal as in diaphyseal bone with greatest deposition at the distal epiphysis, the only site of observed bone growth. A similar difference in the rate of deposition of calcium occurred. That is, lead was deposited at those sites where new

calcium was being deposited. Greater decalcification occurred in the diaphysis than in the epiphyses. The variation in deposition of lead and calcium in different parts of the bone was attributed to the greater vascularity of the soft cancellous bone which occurs at the end of the femora.

2. Contradictory evidence on the metabolism of lead in rats is correlated on the basis of an experiment designed to examine the effect of calcium-phosphorus and lead-phosphorus ratios on lead absorption and deposition. A basal diet with added phosphorus and lead reduced the circulating and deposited lead to nearly one-third of that occurring in rats on a basal diet and lead only. Some decrease in bone lead and maintenance of circulating lead, compared with the control group receiving basal diet and lead only, occurred in a group fed on basal diet with added calcium and lead. The conclusions drawn are that the influence of the lead-phosphorus ratio is restricted mainly to the intestine and increased dietary calcium neutralizes the effect of this ratio.

—D. C. BLOOD.

SUTTON, T. S., KAESER, H. F., & SOLDNER, P. A. (1945.) **Changes in the level of vitamin A and carotene in the blood plasma of dairy cows associated with parturition and beginning lactation.**—*J. Dairy Sci.* 28. 933-939. 151

Vitamin A and carotene values were determined in the blood plasma of 28 cows, seven each of Ayrshire, Jersey, Guernsey and Holstein breeds, at weekly intervals from four weeks before to two weeks after parturition. The levels of both fell consistently during the last three weeks before calving, the minimum level in carotene being reached one week after parturition, while the minimum in vitamin A occurred three days after parturition and amounted to 52% of the pre-partum value.

The total outputs of vitamin A and carotene in the colostrum during the first three days after parturition averaged 48,847 μ g. and 56,524 μ g. respectively. It is suggested that the decrease of these constituents in the blood is due to their diversion to the colostrum.—R. ALLCROFT.

HJÄRRE, A. (1943.) **Om sternalpunktion och den normala benmärgsbilden hos husdjuren. [Sternal puncture and the normal bone-marrow picture in domestic animals.]**—*Skand. Vet-Tidskr.* 33. 457-472. [English & German summaries.] 152

The blood-cell-forming tissues in various animals are discussed. In some, the red and the white cell-producing tissues are sharply differ-

entiated; in others, the same tissues appear to produce both kind of cells.

In cattle, lymphocyte-forming tissues are more developed, with relatively larger lymph nodes, than in horses. As age increases, the active red bone marrow becomes replaced by the inactive yellow marrow. The order in which this replacement takes place for the various bones is described for man and for various domestic animals. Sternal puncture to obtain bone marrow for microscopic examination as an aid to the diagnosis of blood diseases is described and the instrument used and the various cells found are illustrated. The methods used for preparing and staining the slides are also described. A table gives the composition in percentages of the bone marrow in man, horses, cattle, pigs and dogs. The proportion of immature white to red blood cells in the bone marrow was found to vary much in different species of animals. The white-cell-forming tissues appear to be better developed in man, swine and dogs than those forming the red cells, but the opposite is the case in horses and cattle.—M. E. R.

JAKES, L. B., & DUNLOP, A. P. (1945.) The effect of phthalic acid on the prothrombin time of dicumarol-treated dogs.—*Canad. J. Res. Sect. E.* 23. 167-174. 153

Vitamin K administered in large doses neutralized the action of dicumarol in the dog. Likewise, phthalic acid lowered the prothrombin time of dicumarol-treated dogs. The action did not appear to be similar to that of vitamin K and was very transient: it was not prolonged by removal of the kidneys. A similar result was obtained in the completely eviscerated normal dog. Sodium phthalate *in vitro* had no effect on the prothrombin time.—P. J. G. PLUMMER.

LOUVIER, R., & SERFATY, A. (1941.) Action de la castration sur la teneur en catalase du sang du coq domestique. [Effect of castration on the catalase content of the blood of the fowl.]—*C. R. Soc. Biol. Paris.* 135. 552-554. 154

Having shown in a previous paper that the catalase content of the blood of the cock was very different from that of the hen, the authors demonstrated that although unilateral castration of the cock caused no permanent alteration in the catalase level, bilateral castration produced a marked fall.

The catalase content of the blood of a month old cockerel is about the same as that of a capon or a newborn male chick, proving that at the age of one month testicular activity of a cockerel is no more marked than at birth.—R. F. G. S.

BALL, R. F. (1946.) The blood vessels and "ground color" of irises of pigment-free

Single Comb White Leghorns.—*Poult. Sci.* 25. 242-245. 155

The irises of fowls fed a ration deficient in carotenoid pigments for 280 days were used in a study of the vascularity and ground colour of the iris.

The blood supply of the iris comes from four large vessels, forming the circulus arteriosus major which passes around the iris near its pupillary border and gives off transverse branches which pursue a sinuous course to the scleral or pupillary borders. There is extensive branching and anastomosis of the small vessels at the pupillary border.

Four colour zones could be distinguished in the iris. They comprised an outer light grey zone extending from the periphery of the iris to the circulus arteriosus major, a wide light grey zone extending inwards and surrounding the third, narrow, dark grey zone and finally an innermost narrow black band, the terminal portion of the pars iridica retinae.—F. D. ASPLIN.

ROBERTS, F. (1945.) Return of the blood to the heart. A criticism of the orthodox view.—*Lancet.* 248. 209-211. 156

The accepted theory that venous return of the blood to the heart is activated by muscular contraction and aided by valvular action in the veins is criticized on the grounds that in the absence of marked muscular activity the venous return is still maintained and that valves cannot operate as such under normal conditions, for if they opened and closed the blood flow would be intermittent. The value of Bainbridge's experiments is also discussed. R. favours the view that the heart is the sole motive force of the circulation.

—C. W. OTTAWAY.

ROSSOFF, I. (1946.) The lymphatic circulation of the hind limbs of the horse.—*Cornell Vet.* 36. 51-66. 157

R. describes a modified technique for lymphatic injection and gives an account of his observations on the lymphatic tracts in the hind limb of the horse. In the leg, vessels were arranged along the course of the main superficial veins and led eventually into the deep inguinal lymph node, those on the medial aspect directly, those on the lateral aspect *via* the popliteal node. Within the hoof, the pattern, which was obtained by intra- and subkeratogenous injection of the foot of a foal, demonstrated vessels in close proximity to blood vessels and a maze of smaller vessels within the digital cushion and adjacent area of the coronary band.

R. is of the opinion that compression of these latter vessels by the digital apparatus is the prime motive factor of lymph circulation in the limb.

On this account, exercise, forced if necessary, as well as massage is recommended for cases of lymph stasis.—C. W. OTTAWAY.

SCHÖNBERG, F., & MILBRADT, H. (1942.) Zur Frage der Totenstarre bei ausgeschlachteten und abgehäuteten Tieren. [**Rigor mortis in eviscerated and flayed animals.**].—*Z. Fleisch- u. Milchhyg.* 53. 55–57. 158

The authors do not support the view of BONGERT [see *V. B.* 16. 366] that rigor mortis develops only under anaerobic conditions in intact cadavers. Six dogs were electrocuted and eviscerated rapidly and three of these were skinned. Rigor mortis began in periods varying from 1 to 1½ hours and was complete 2–3 hours after death. A dog which after death had its abdominal and intrathoracic cavity filled with air and two animals which after death received large intrathoracic and intra-abdominal injections of H₂O₂ solution also developed rigor mortis in the usual manner.—E. F. MCCARTHY.

*WASSILEFF, W. S. (1943.) Klinische Versuche an Rindern über die cystoskopische Beobachtung der Farbstoffausscheidung durch die Nieren. [**Cystoscopic observations on the elimination of dyestuffs from the kidneys in cattle.**].—*Inaug. Diss., Berlin.* pp. 29. [Abst. from abst. in *Jber. Vet.-Med.* 71. 200.] 159

The intravenous injection into cattle of an 0.4% aqueous solution of indigo carmine causes, if the kidneys are normal, the discharge of coloured urine from the ureters in 4–8 min. Before the introduction of the endoscope the bladder is distended with air or physiological saline, the operation being carried out under extradural anaesthesia.—E. F. MCCARTHY.

*HAEMPEL. (1942.) Geschlechtshersage beim Fötus im Mutterleibe. [**Prediction of sex before birth.**].—*Forsch. Fortschr. dtsch. Wiss.* 18. 221. [Abst. from abst. in *Tierärztl. Rdsch.* 49. 47–48.] 160

The test here described is based on the fact that the quantity and ratio of male and female sex hormones in the urine is altered in pregnancy. Six male and six female bitterling fish each receive an intraperitoneal injection of 0.025 ml. urine from a pregnant woman on three successive days. Development of mating display and increase in length of the oviduct are said to indicate male and female foetuses respectively. Prediction was accurate in 86.5% of the 104 cases investigated. The test may be applied between the third and ninth month of pregnancy. Some factors which invalidate the results are discussed.—E. F. MCC.

HARRISON, R. J. (1946.) The early development of the corpus luteum in the mare.—*J. Anat.*

80. 160–166. [Author's summary copied *verbatim.*] 161

An account is given of the development of the Graafian follicle in the mare and the presence of a thecal gland in mature and atretic follicles is demonstrated. The thecal gland is most developed just before ovulation. After ovulation the cells atrophy, lose their vacuolated appearance, and are incorporated in the corpus luteum among the luteal cells.

The early development of the corpus luteum is described in a series of twenty-two animals. The luteal cells are derived from the granulosa cells. The corpus luteum reaches its maximum development by the 10th–14th day after ovulation. At this time the luteal cells begin to show a vacuolated outer zone and an inner perinuclear homogeneous area.

The histological changes in a series of six artificially ruptured follicles are given. There is a marked hypertrophy of the theca interna cells, similar to the lutealizing changes in granulosa cells, 5–10 hr. after rupture. The granulosa cells do not show lutealizing changes until 18 hr. after rupture. The theca interna cells start to diminish in size and show vacuolation, and invade the luteal cells 21 hr. after rupture.

The possible significance of the findings in the ruptured follicles is discussed.

HILLESUND, C. M. (1943.) Undersøkelser av hypofysen hos sølvrev med spesielt henblikk på eventuelle svingninger i forbindelse med kjønns- cyklus hos hanreven. [**The pituitary gland of the silver fox with special reference to the sexual cycle of the male fox.**].—*Norsk. Vet-Tidsskr.* 55. 174–180, 189–219, 245–256, 290–302, 309–332 & 366–394. [English and German summaries.] 162

H. presents a detailed study of the correlation between the male gonads and the pituitary gland as regards histological characters. The fox was chosen for study owing to the seasonal variation in sexual activity, which would give clear distinction between sexual activity and inactivity.

Sections of testes, prostate and pituitary were prepared by conventional methods and examined. The testes of the sexually inactive fox contain tubuli contorti which are lined by a single layer of cells and contain in their lumina nothing but filamentous cytoplasm. Large cells called large spermiogonia are to be seen in limited numbers. With the advent of the mating season which lasts from late in January until late March, all cellular elements in the testes proliferate and the tubuli contorti become thicker and the spermatocytes appear and finally spermatozoa. After April the testicular tissues revert to an inactive state.

The prostate behaves analogously. The

structure of the pituitary body of the fox is described and illustrated in figures. It is small (30 mg. in weight) and consists of nervous, intermediate and glandular parts, the latter being the largest and anterior in position.

In the anterior lobe cells can be differentiated into three kinds, basophile, eosinophile and chromophobe. Only the basophile cells show a correlation in number with the gonad cells. At the start of sexual activity the basophile cells are at the most numerous and highest in proportion in comparison with the other cells, so it appears that these cells are the source of gonadotropic hormone.—J. E.

AYLWARD, F., & OTTAWAY, C. W. (1945.) **The collection and examination of plasma from pregnant mares for gonadotrophic hormone.**—*J. comp. Path.* 55. 159-167. 163

Weekly collections of blood (2.0-4.5 litres) were taken from seven pregnant Welsh ponies from about the 45th to the 80th day of pregnancy. Biological assays for gonadotropic activity were carried out on plasma samples. The highest values were obtained between the 55th and the 64th day, with the peak concentrations of 73,000-440,000 I.U. per litre. The regular collections of blood had no pronounced effect on the health of the ponies or on the duration of pregnancy.

Technical details of the preparation of the plasma are discussed.—ALFRED T. COWIE.

COLE, H. H., & HUGHES, E. H. (1946.) **Induction of estrus in lactating sows with equine gonadotropin.**—*J. Anim. Sci.* 5. 25-29. 164

Twenty-six of 27 sows injected with 750-1,500 I.U. pregnant mare's serum gonadotropin between the 39th and 68th day of lactation came into oestrus 3-7 days after the injection. All the sows were mated and of 20 on which further information was available 19 became pregnant. The size of the litters and the duration of pregnancy appeared to be normal.

Of 15 sows injected with gonadotropin between the first and the 38th day of lactation, only four, injected on the second, 30th, 35th and 38th days, came into oestrus. One of these sows became pregnant.

Of seven control sows, one came into oestrus on the 66th day of lactation.

It is concluded that the time between successive farrowings could be shortened by 2-4 weeks by the use of pregnant mare serum gonadotropin on or after the 40th day of lactation.

—ALFRED T. COWIE.

CHU, J. P., & YOU, S. S. (1945.) **The role of thyroid gland and oestrogen in the regulation of gonadotrophic activity of the anterior pituitary.**—*J. Endocrinol.* 4. 115-124. 165

The authors claim that in the rabbit, the

thyroid stimulates the secretion of luteinizing hormone by the anterior pituitary and inhibits the formation of follicle-stimulating hormone. Evidence was obtained that oestrogens probably stimulate the activity of the thyroid by the liberation of thyrotropic hormone from the pituitary.—ALFRED T. COWIE.

JAAP, R. G. (1945.) **Activity of synthetic oestrogens on oral administration in the domestic fowl and turkey.**—*Endocrinology.* 37. 369-376. 166

In view of recent developments in the use of synthetic oestrogens in the fattening of poultry, the authors investigated the oral activity of 17 synthetic oestrogens in the domestic fowl and turkey. The oestrogens were administered from the day of hatching to the 16th day and the index of activity was based on the increase in oviduct weight. The birds were autopsied on the 17th day.

Dianisylhexane (the dimethyl ether of hex-oestrol) was most active in the fowl, at the level of 10 mg. per lb. of feed but was practically inactive in the turkey poult. Dianisylhexene (the dimethyl ether of diethylstilboestrol) at levels of 20 mg. or more per lb. of feed was the most active oestrogen for oral administration in both species.

Data were obtained which indicated that the activity of synthetic oestrogens was increased when they were dissolved in soya bean oil before dispersion in the feed.—ALFRED T. COWIE.

MARSHALL, F. H. A., & HAMMOND, J., Jr. (1945.) **Experimental control by hormone action of the oestrous cycle in the ferret.**—*J. Endocrinol.* 4. 159-168. 167

Tablets of oestrogens implanted into anoestrous or ovariectomized ferrets produced and maintained oestrus, as indicated mainly by the enormous swelling of the vulva, for indefinite periods. This effect could be inhibited by the implantation of progesterone tablets. Some evidence was obtained that testosterone had a similar antagonistic action. Implants of oestrogens appear to decrease the powers of resistance of the animal to certain infections, since some 80% of the implanted ferrets developed septic conditions of the uterus and other organs and died.

—ALFRED T. COWIE.

SIMÕES, A. (1944.) **Contribuição para o estudo da nomenclatura das regiões externas do corpo dos bovídeos. [Nomenclature of the anatomical regions of cattle.]**—*Rev. Med. vet., Lisboa.* 39. 448-455. 168

This is a list of lay terms commonly used to describe the external anatomy of the bovine, together with the scientific equivalent of each term.—ISOBEL W. JENNINGS.

BRUCE, H. M., KON, S. K., WATSON, J. V., COTCHIN, E., & WHITE, E. G. (1946.) **A radiographic study of the normal development of the hock joint of the fowl.**—*J. comp. Path.* 56. 49–52. 169

The development of the normal hock joint of the fowl was studied by means of weekly radiographs of ten Rhode Island Red—Light Sussex cross cockerels. No change in shape or proportion was observed up to eight weeks of age, the picture then presented being that of two proximal tarsal elements close to but distinct from the tibia, and a single distal bone separated from the unfused metatarsals by a zone of cartilage matrix. During the next four weeks, the proximal tarsal bones approximate, fuse and become joined with the tibia. At 20 weeks of age there was no sign of the mode of origin of the now formed tibio-tarsus. Ossification of the distal tarsal element was found to be more leisurely. With increase in diameter and thickness, its proximal surface became adapted to articulate with the pre-formed tibio-tarsus, but not until 20 weeks of age was fusion with the metatarsals complete. Evidence of this union was visible up to two years of age. The article is well illustrated with radiographs.

—C. W. ÖTTAWAY.

ANON. (1945.) **Progress in the investigation of shock.**—*Brit. med. J.* Nov. 17th. 695. 170

This brief account of articles by ROSENTHAL *et al.* describes studies on experimental shock in mice. It was found that mice subjected to burns, trauma or haemorrhage survived an otherwise fatal injury if given isotonic sodium salts, but similarly shocked mice were more susceptible to the injection of a potassium salt, dying as a result. There was much loss of fluid and sodium into the injured area and a large escape of potassium from it. The increased toxicity of potassium for "shocked" mice has also been found to apply to "shocked" rabbits.—E. COTCHIN.

GREEN, H. N. (1945.) **Biochemical factors in the aetiology of "shock".**—*Brit. med. Bull.* 3. 102–105. 171

The precise nature of shock is unknown and it is still a matter of doubt whether it is due to oligæmia conditioned entirely by fluid loss, to toxic factors (normal or abnormal metabolites liberated in the injured area) or to a nervous reflex mechanism. Shock is as fundamental a reaction as inflammation and possibly the two processes are linked in some degree. Recent evidence indicates that fluid loss *per se* is not sufficient to account for death from hind limb ischaemia. There is conflicting, and not conclusively positive, evidence that blood or lymph drained from an injured area has a shock-inducing effect when transfused into a normal animal.

The theory that toxic metabolites are initiating factors in shock has stimulated the search for such substances. Earlier beliefs that histamine or a histamine-like substance is responsible have gradually declined, although some evidence is forthcoming of an increase in blood histamine following limb ischaemia. Studies of the effect of potassium (from its known toxic effects in excess upon heart muscle) suggest that rise in serum K is a reflection of severe tissue damage but that this rise is not an initiating factor in shock. Considerable attention has been given to adrenalin and the cortical hormones. It seems unlikely that a diminution in the output of the latter is the primary cause of shock, but the role of the adrenal cortex in modifying the degree of shock following trauma may still prove to be important. Its relation to Na metabolism and Na depletion after injury may be an important factor in the development of shock.

Watery extracts of many tissues intravenously injected have a depressor action, but the resultant shock has been shown in many instances to derive from anaerobic infections; the existing evidence indicates that ischaemic shock in dogs is in a large measure due to infection. Renewed searches for toxic factors present in normal and injured muscle were stimulated by the close similarity of the cardiovascular effects of fractionated muscle extracts and those of adenosine triphosphate (ATP). There is some evidence that adenyl compounds are released from injured tissues and there is a close biological similarity between shock induced by trauma and by ATP.

The relationship between the crush syndrome in man and the shock problem is discussed. G. considers that the crush syndrome may be a gross manifestation of the early renal failure seen in all types of shock, and suggests that the biochemical approach should dominate the next stage in its exploration of the chemical changes in injured tissues.—A. EDEN.

SHAW, J. C. (1946.) **Lactic acid, pyruvic acid, amino acids, acetone bodies, oxygen, carbon dioxide, and hemoglobin in arterial and mammary venous bloods of cows under various physiological conditions.**—*J. Dairy Sci.* 29. 188–197. 172

Studies were made on normal dairy cows to determine whether there were any significant differences between the arterial and venous blood supply to the active mammary gland in respect of various constituents. Similar observations were made on cows under nembutal anaesthesia and in cases where the percentage of milk fat had been depressed by feeding fish oils. The respiratory quotient of the active mammary glands of both normal cows and those fed fish oil was greater

under nembutal anaesthesia than unity, with mean values of 1.27 and 1.31 respectively. The mean respiratory quotient of the glands of unanaesthetized cows fed fish oil exceeded unity in most of the experiments, averaging 1.16. From these data it is still doubtful whether a metabolic relationship exists between the respiratory quotient of the gland and the synthesis of the lower fatty acids.

The mean arterio-venous difference for pyruvic acid was so slight that blood pyruvic acid appeared to be of little significance in the metabolism of the active mammary gland. The latter did not appear to utilize any significant amount of blood lactic acid, nor were the arterio-venous differences for lactic and pyruvic acids significantly altered between normal lactating cows, on the one hand, and cows fasted, fed on fish oil or not lactating, on the other. No significant alteration in the utilization of amino acids or of acetone bodies was observed by depressing the percentage of milk fat and the lower fatty acids by feeding fish oils. Haemoglobin studies confirmed earlier findings that little or no arterio-venous change occurred in unagitated cows and the changes found in anaesthetized cows were slight.—A. EDEN.

GALLUP, W. D., & HOBBS, C. S. (1944.) **The desiccation and analysis of feces in digestion**

experiments with steers.—*J. Anim. Sci.* **3**. 326–332. **173**

An investigation was made into the errors which can occur in the analysis of faeces. The nitrogen content was estimated both of the wet fresh faeces and of the air-dried samples, drying taking place at 100°C. and at 60°C. Loss of N at 100°C. varies from 4.3 to 10.7% and at 60°C., from 4.1 to 6.4%. Addition of acid alcohol to the samples reduces but does not entirely prevent N loss, unless acid is used in strength and quantity to lead to error from absorption of atmospheric ammonia and interference with ether-extraction. Therefore the authors recommend that N analysis be made on wet samples and the necessary calculations made.

Moisture absorption from the atmosphere after drying can reach 3% even when the samples are kept in a calcium chloride desiccator, unless the faeces containers have tight-fitting lids. The moisture-absorption factor is important in estimating the ether extract, but errors of up to 25% can occur here through using ether that is not anhydrous or alcohol-free.

It is easy to get a well mixed representative sample from wet faeces, but with samples of low moisture content, thorough mixing of three small samples taken at random is recommended.

—W. H. PARKER.

See also absts. **110** (morphology of mammary glands), **111** (environmental temperature and cancer), **114** (sex hormones and lymphomatosis), **123** (semen, examination of), **126** (biochemistry of genital tract), **129** (hereditary disease), **140**, **144** (high environmental temperatures), **146** (sex hormones and ascorbic acid), **214** (sex hormones and pyometra), **240** (pH of blood and body fluids), **241** (arterial pressure), **242** (sedimentation of erythrocytes), **262** (biochemistry).

POISONS AND POISONING

FENSTERMACHER, R., POMEROY, B. S., ROEPKE, M. H., & BOYD, W. L. (1946.) **Lead poisoning in cattle.**—*J. Amer. vet. med. Ass.* **108**. 1–4. **174**

A discussion on the occurrence, symptoms and P.M. findings in lead poisoning in cattle is given. It is pointed out that it is not possible to diagnose lead poisoning as a result of histopathological examination of tissues and that a chemical examination is necessary to confirm diagnosis as well as careful consideration of all circumstantial evidence. The amount of lead found in the livers of 20 cases of suspected lead poisoning ranged from nil to 12 mg. per 100 g. wet basis (i.e., nil to 120 p.p.m.); the livers of two normal control animals contained 0.05 and 0.8 mg. per 100 g. respectively. Interpretation of the analytical results is based entirely upon the personal opinions of the authors. In their view, concentrations of 0.3 mg. % Pb on a wet basis are of no significance; concentrations of 0.5 mg. % are very suspicious and may be lethal. Amounts of 1.0 mg. % of Pb or more are considered positive evidence of the ingestion of lead in lethal amounts.

—R. ALLCROFT.

HEPLER, O. E., & SIMONDS, J. P. (1945.) **Experimental nephropathies. III. Calcification and phosphatase in the kidneys of dogs poisoned with mercury bichloride, potassium dichromate and uranyl nitrate.**—*Arch. Path.* **40**. 37–43. [For part II, see *V. B.* **16**. 76.] **175**

Groups of dogs were poisoned by mercuric chloride, uranyl nitrate and potassium dichromate and chemical and histological studies were made of the kidneys P.M. Although necrosis of the kidneys is frequently accompanied by calcification, the amount of Ca deposited varies with the nature of the poison, the dosage and the interval between administration and death. There was calcification in the kidneys of all dogs poisoned with mercuric chloride, in less than half of those killed by uranyl nitrate and in about a fifth of those given potassium dichromate. It was shown that phosphatase was not a factor concerned with the deposition of Ca in the kidneys of these dogs; in fact, Ca appeared to be deposited only in those tubules in which the epithelium had been so severely damaged that the phosphatase had been destroyed or rendered inactive. Calcification was most abundant in the

proximal convoluted tubule which (in dogs) normally contains fat and it is suggested that the presence of fat may be a factor in Ca deposition in the kidneys, at least under the conditions of these experiments.—A. EDEN.

ROBERTSON, A., CAMPBELL, J. G., & GRAVES, D. N. (1945.) **Experimental zinc phosphide poisoning in fowls.**—*J. comp. Path.* 55. 290–300. 176

During the war zinc phosphide was used extensively as a rat poison and cases of poisoning in domestic birds and mammals were attributed to its use. The authors gave doses of 5–100 mg. per kg. body weight to adult fowls, using a 1 : 10 mixture of zinc phosphide in starch, enclosed in gelatin capsules. The lethal dose was generally about 10 mg. but ranged from 7 to 17 mg. per kg.

Two fowls, given small doses daily, tolerated a total of about 30 mg. per kg. Determinations of Zn and of volatile P were made on the contents of the crop, gizzard and intestines and the Zn content of various internal organs was also determined. The modified colorimetric method described for determination of volatile P gave an accuracy of 5% with quantities of about 0.005 mg. P. The symptoms of poisoning were not diagnostic: they comprised dullness, ruffled feathers, passage of greenish fluid faeces and death without signs of struggling. Autopsy findings included venous congestion, fluid in the serous cavities and enteritis. The [carbide-like] odour of phosphine was detected in the crop in all but three of 17 fowls which died: it was only occasionally detected in the gizzard.

The findings show that one tablespoonful of the rat bait usually employed contains sufficient Zn_3P_2 to poison 50–60 birds. Volatile P could be detected even after advanced decomposition P.M. To distinguish from poisoning caused by free P the estimation of Zn in the crop contents is of value; the determination of both Zn and P is necessary to decide whether Zn_3P_2 is the poison concerned.—E. G. WHITE.

DAVIS, J. E., MCCULLOUGH, A. W., & RIGDON, R. H. (1945.) **Polycythemia produced by cobalt in the duck. A hematologic and pathologic study.**—*J. Lab. clin. Med.* 30. 327–336. 177

Ducks three weeks old were given subcutaneously varying doses of a 2% aqueous solution of cobaltous chloride. It was found that this treatment produced a polycythaemia accompanied by an early hyperplasia of the bone marrow and an increase in extramedullary erythropoietic masses in the liver, spleen, kidney and adrenal glands. A continuation of the treatment resulted in marrow hypoplasia, a disappearance of extramedullary erythropoietic foci and a

reduction in the phagocytic activity of the reticulo-endothelial elements of the liver and spleen.

—A. BUXTON.

HUEPER, W. C. (1944.) **Experimental studies on the therapy and the prevention of degenerative vascular diseases. II. The effects of several detergents on experimental cholesterol atheromatosis of rabbits.**—*Arch. Path.* 38. 381–391. [For part I, see *V. B.* 15. 211.] 178

Oral administration of certain anionic detergents elicited degenerative and calcifying lesions in the aorta of rabbits, in addition to causing pulmonary lesions, whereas a cationic detergent tested did not produce any vascular reactions. Rabbits injected intravenously with anionic detergents showed hyaline degeneration of cerebral and renal arterioles. In rabbits given cholesterol *per os*, oral administration of the anionic detergent "aerosol OT" seemed to interfere in some degree with the development of hypercholesterolaemia and atheromatosis, while these processes appeared to be hastened and aggravated by the non-ionic detergent tested.

It is suggested in the discussion that there may be an antagonism between the factors favouring atheromatosis and those favouring thrombosis, related to the wettability of the vessel wall, the state of the circulation and possibly also the local $O_2 : CO_2$ tension of the blood.—E. C.

I. WOODARD, G., NELSON, A. A., & CALVERY, H. O. (1944.) **Acute and subacute toxicity of DDT (2,2-bis(p-chlorophenyl)-1,1,1-trichloroethane) to laboratory animals.**—*J. Pharmacol.* 82. 152–158. 179

II. DRAIZE, J. H., NELSON, A. A., & CALVERY, H. O. (1944.) **The percutaneous absorption of DDT (2,2-bis(p-chlorophenyl) 1,1,1-trichloroethane) in laboratory animals.**—*Ibid.* 159–166. 180

I. Realizing that the synthetic insecticide D.D.T. might become extensively used and that, being odourless and tasteless, large amounts of it might be unwittingly consumed, the authors carried out investigations to determine the hazard of ingestion. In their experiments on several species of animals, the D.D.T. was either dissolved in maize oil or used as a dry powder. D.D.T. was found to be acutely toxic when given by mouth to rats, mice, g. pigs, rabbits and chickens in doses ranging from 150–750 mg. per kg. body weight. When injected intramuscularly and intraperitoneally the drug was less toxic than when given by the oral route; further, D.D.T. was found to produce toxicity more readily in solution than in suspension. Acutely toxic doses produced anorexia, tremors, depression and death. D.D.T. was also found capable of causing subacute

toxicity when given in small amounts in the diet over periods of three days to 20 weeks. Definite signs of toxicity were produced by levels in the diet of 0.05% in rats and mice, 0.1% in g. pigs and less than 0.05% in growing chickens. Characteristic of D.D.T. poisoning was the wide variation in the intensity of toxic signs exhibited by the different species of animals, by different individuals within the species, and in response to varying doses of the drug; this makes it extremely difficult to estimate a safely tolerated dose although there appears to be one safety factor, *viz*, the effect on the appetite: this is usually the first sign of toxicity.

II. The authors made a toxicological investigation of the skin penetration of D.D.T. as a result of the reported suitability of D.D.T. preparations for cutaneous application in the treatment of louse infestations and scabies and the possible hazard of unavoidable contact in handling preparations of this drug. The experimental technique involved the use of a soft rubber cuff, shaped as a girdle fitting snugly around the trunk of the test animal, under which the D.D.T. was introduced in graded amounts on a body-weight basis. It was found from these experiments that powders containing 5% D.D.T., when applied to the skin, produced no evidence of systemic toxicity or of primary irritation, and that 30% and 25% solutions of D.D.T. in dimethyl and dibutyl phthalates respectively were absorbed by both intact and abraded skin and caused severe poisoning. The inunction of doses as low as 0.5 ml. of a 30% solution of D.D.T. per kg. per day (*i.e.*, 150 mg. per kg. per day of D.D.T.) to rabbits, rats and g. pigs caused death after 30 days in some cases; dogs were less susceptible to poisoning from cutaneously applied D.D.T. solutions. There were wide individual variations in susceptibility among the different test animals and those affected had anorexia, severe loss in weight, hyperexcitability and nervous tremors, leading to convulsions. Severely poisoned animals had a moderate leucocytosis with a marked increase in the percentage of heterophiles, while emaciated animals were easily affected by secondary infections. It is concluded that the unlimited use of D.D.T. solutions on skin is not free from danger, but some solutions containing D.D.T. in concentrations up to 5% were considered safe for restricted use.—J. N. OLDHAM.

SHERMAN, S. R., & BINDER, C. F. (1944.) **Hazards of carbon tetrachloride in present-day use.**—*U.S. Nav. med. Bull.* 43. 590-599. 181

The symptoms of carbon tetrachloride poisoning in man comprise irritation of the nose, eyes and throat, headache, nausea, vomiting, abdominal pain, diarrhoea, stupor deepening into coma,

convulsions, weak pulse, fever and uraemia culminating in death. The drug is about twice as toxic as chloroform and 100 times as toxic as ethyl alcohol. Poisoning can take place through inhalation, skin contact or oral administration. Carbon tetrachloride belongs to a group of chemicals conspicuous for their tendency to cause liver lesions: hence there has been a tendency to overlook the fact that the principal and sometimes sole effect in cases of poisoning with the drug is on the kidneys. Diffuse fatty degenerative liver changes with acute toxic renal damage are characteristic. In treatment of poisoning, unabsorbed carbon tetrachloride should be removed from the gastrointestinal tract by stomach lavage and colonic irrigation. Copious fluids should be given parenterally, together with 10% calcium gluconate solution intravenously every 12 hours and calcium lactate by mouth. Where great liver damage already exists, liver extract should be given, together with thiamine chloride or synthetic vitamin K. Whole blood and plasma transfusions are valuable in cases of associated shock. In prophylaxis, a fat-free and alcohol-free diet is important.—D. D. OGILVIE.

*TAMM, O. (1944.) Zur Frage der Toxizität des Phenothiazins. [**Toxicity of phenothiazine.**]—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 332.] 182

Single doses of 0.53-4.6 g. of phenothiazine per kg. body weight by stomach tube to dogs and cats caused no visible symptoms, but produced anaemia with a fall in the red blood cell count of 6.1-48.7% and in the haemoglobin of 4.6-31.9%, reaching maxima between the second and seventh days. There was a leucocytosis. P.M. examination showed no gross abnormality.—J. E.

RIGGS, C. W. (1945.) **Nitrite poisoning from ingestion of plants high in nitrate.**—*Amer. J. vet. Res.* 6. 194-197. 183

R. describes a series of outbreaks of apparent poisoning in four widely separated turkey flocks following heavy rain, after a period of drought. Two of the flocks were on oat stubble, one was on wheat stubble and the fourth on an uncultivated field. Affected birds had depression, diarrhoea and some degree of cyanosis; the mortality range was 0-12%.

A diagnosis of nitrite poisoning was made since nitrite was found in the blood and faeces of affected birds; negative results were obtained in tests for nitrite in normal birds, and there was no evidence of bacterial disease or cyanide poisoning. The syndrome was reproduced by administering nitrite to a healthy bird.

Experiments showed that when moistened

and exposed to air, oat hay converts its nitrate to nitrite, a maximum being reached 20 hours after the hay is moistened. Within 3-5 days there was very much less nitrite and after ten days none was detected.—H. PAVER.

MCCUNN, J., ANDREW, H., & CLOUGH, G. W. (1945.) **Castor-bean poisoning in horses.**—*Vet. J.* 101. 136-138. 184

The authors describe a series of cases of poisoning in a stud of working horses due to the accidental contamination of the food with castor beans. Characteristic symptoms were profuse sweating, a straggling rocky gait, a slightly elevated temperature, tetanic spasms in the muscles and a tumultuous heart and pulse. The visible mucous membranes were dark and injected; there were no throat lesions. Diarrhoea was a constant feature; in no case was there any sign of blood in the faeces.

A delayed action of 1-2 days before the onset of the more serious symptoms was observed in some cases. P.M. findings which were considered typical included fluid or semi-fluid contents of the alimentary tract and patchy areas of inflammation in the mucous membranes of the tract with the exception of the small colon and rectum. The liver, kidneys and spleen had a degree of oedema and cloudy swelling; the

See also *absts.* 150 (lead content of tissues), 153 (dicumarol).

lungs were oedematous, the bronchi and trachea being full of frothy oedematous fluid and there was engorgement of the right side of the heart. The mesenteric, bronchial and hepatic lymph nodes were swollen and oedematous. Recovery was slow if purging was delayed.—H. PAVER.

HAAG, J. R. (1945.) **Toxicity of nematode infested Chewings fescue seed.**—*Science.* 102. 406-407. 185

H. records losses among sheep fed on a certain lot of screenings of Chewings fescue grass (*Festuca rubra* and *F. commutata*) essentially free from noxious weed seeds and ergot sclerotia. In feeding experiments rats, were seriously affected or died after eating normal stock ration mixed with varying amounts of the screenings. Symptoms frequently observed were incoordination to complete paralysis of the hindquarters, extreme swelling and dark red discoloration, usually of one rear leg only often followed by sloughing of affected tissues, dark blue discoloration of the tail often followed by tail eating, and extensive tissue haemorrhages. Preliminary experiments with chicks two weeks old showed them to be even more sensitive than rats to the toxic substance which, it is suggested, is related to the degree of infestation of nematode (*Anguina agrostis*) galls in fescue seeds.—J. N. OLDHAM.

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

DENNINGTON, A. R. (1945.) **Ultraviolet as a protective agent in preparation of pharmaceuticals.**—*Heat. Pip. Air Condit.* 17. 398-401. [Abst. in *Bull. Hyg., Lond.* 20. 699, copied *verbatim*. Signed: ROBERT CRUICKSHANK.] 186

This is a review, without factual data, on the possible uses of ultraviolet radiation in preventing airborne contamination of pharmaceutical materials during the processes of manufacture, handling and dispensing on a large scale by wholesale firms. Several pharmaceutical establishments in America are reported as having 200-500 U.V. lamps, emitting bactericidal radiation at 2537 Å. The light is usually directed downwards to the field of operation, and is used in such processes as the handling of sera, preparation of vaccines, inoculation of culture media, preparation of penicillin, maintaining the sterility of glass-ware and filling ampoules. Not much is said about protecting the workers against the U.V. radiation; any transparent glass or plastic eye shield will protect the conjunctivae. U.V. radiation is also recommended for the control of respiratory infection among the office-workers and for preventing the spread of infection among laboratory animals.

JANSEN, E. F., & HIRSCHMANN, D. J. (1944.) **Subtilin—an antibacterial product of *Bacillus subtilis*. Culturing conditions and properties.**—*Arch. Biochem.* 4. 297-309. 187

Cultures of *B. subtilis* on synthetic media containing sucrose, asparagine and mineral salts contain a substance, subtilin, which inhibits growth of staphylococci, *Lactobacillus casei* and *Micrococcus conglomeratus*. The amount of subtilin produced was greatly increased on addition of manganese salts to the media. Active material could be extracted with alcohol and preparations generally gave a blue colour on the addition of ferric chloride. The antibacterial activity is heat-stable. It is stable in acid solution but is destroyed in alkaline solution.—E. BOYLAND.

WAKSMAN, S. A., & SCHATZ, A. (1945.) **Strain specificity and production of antibiotic substances. VI. Strain variation and production of streptothricin by *Actinomyces lavendulae*.**—*Proc. nat. Acad. Sci.* 31. 208-214. [Abst. in *Bull. Hyg., Lond.* 20. 759, copied *verbatim*.] [For part IV, see *V. B.* 16. 319.] 188

Different cultures of *A. lavendulae* differ greatly in their capacity to produce the antibiotic

substance streptothricin. Active cultures of *A. lavendulae* were found to give variants that differed morphologically, culturally and physiologically from the parent strain. Variants free of aerial mycelium did not produce any streptothricin.

POSTL, E. (1944.) Meine Erfahrungen über die Behandlung einiger Erkrankungen mit Albucid. Vorläufige Mitteilung. ["Albucid" therapy. Preliminary article.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* March 17th. 92-98. 189

P. describes the local use of albucid [sulphacetamide] either as a powder or as an ointment made up with eucrin: it was used successfully in the treatment of infections of various types. It is remarkably painless in its action and allows rapid drying and healing.—J. M. ROBSON.

BOWEN, C. V. (Undated.) Organic iodine compounds tested against insects, fungi and bacteria. A review of the literature. pp. 20. New York: Iodine Educational Bureau, Inc. 4to. 190

A review was made of 294 organic iodine compounds used as insecticides, fungicides and bactericides. Items of veterinary interest include the following:—

Screwworm larvae are killed at dilutions of 0.03-0.17% by a number of compounds including *o*-iodo-anisole, 4-iodo-azobenzene, 1-bromo-4-iodo-benzene, 1-iodo-2-nitrobenzene, 1-iodo-3-nitrobenzene, iodoso-benzene, 1-iodoso-4-nitrobenzene, 2-iodo-biphenyl, 4-iodo-biphenyl, 2-iodo-naphthalene, *p*-iodo-phenetole, and quolinium compound, ethyl-iodide. Of these the most active appears to be 1-iodo-3-nitrobenzene.

Iodosobenzoic acid (sodium salt), *o*-iodoso-benzoic acid and iodoxy benzoic acid (sodium salt) were recommended as germicides, being highly active against the usual test organisms and against *Pseudomonas pyocyanea*. *O*-iodoxy benzoic acid has been used clinically in cases of Vincent's angina and trench mouth and is germicidal in high dilution against streptococci and staphylococci in the presence of blood serum. Fluorescein and derivatives are recognized as having excellent germicidal properties. Iodocholeate is approximately three times more effective as a bactericide against vegetative organisms than iodine in KI solution; it also has a more intense and prolonged fungicidal action.

Tetra-iodo-tannate compound is claimed as useful in the control of coccidiosis and other intestinal parasitic diseases and 2:6-di-iodo-1-phenol-4-sulphonic acid (mercurous salt) is said to kill scabies mites in 24 min. Neither of these claims has been substantiated, nor have the compounds come into clinical use.—D. D. OGILVIE.

— (1945.) Examination of germicides and antibacterial agents. Laboratory section. [Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents.]—*Amer. J. publ. Hlth.* 35. 839-846. 191

Individual accounts are given of the following.

CHEMICAL ANTISEPTICS. The testing of antiseptics *in vitro* is dependent upon uniform batches of broth. Even apparently uniform batches of peptone vary amongst themselves and in their ability to maintain the resistance of *Staphylococcus aureus*. Tests are in progress with peptones produced by digestion of casein in endeavours to secure a medium which is uniform and reproducible.

For comparing the efficacy of spore-destroying germicides offered for use for cold sterilization of surgical instruments a special hinged joint has been developed which can be contaminated by blood containing a suspension of spores. This gives a controlled reproduction of those parts of surgical instruments not accessible to scrubbing before immersion in a sterilising fluid.

CHEMICAL DISINFECTANTS. The need for consistent and uniform media for testing germicides has been partly met by a semi-synthetic medium of considerable promise. A tryptic digest of casein proved to be satisfactory and consistent for the production of test cultures of *Salmonella typhi* and *Staph. aureus*, eliminating the use of beef extract and thereby one important source of variability in carrying out determinations of the efficacy of a germicide under practical conditions.

ANTIBIOTIC AGENTS. Investigations have continued for further determination of the potentialities of penicillin. These have included studies on the isolation and selection of higher yielding strains, the nutrient requirements and cultural conditions favourable to penicillin production, different methods of assay, the production of penicillin by other fungi, the chemical and physical properties of penicillin, utilization for disease control and the mode of action of penicillin upon bacteria *in vitro* and *in vivo*. Other antibiotics studied include streptothricin and streptomycin and those produced by various species of *Aspergillus*, such as fumigacin, clavacin and gliotoxin.

DISINFECTION OF AIR BY GERMICIDAL VAPOURS AND MISTS. The principal advances in this field have been in the evolution of improved vaporizers for dispersion of glycol vapours and of automatic devices for controlling the concentration of glycol vapour in air. Studies have continued with the use of such vapours for reducing the incidence of respiratory diseases in hospital wards.

DISINFECTION OF AIR BY ULTRA-VIOLET

RADIATION. Further work has proceeded on the sensitivity of viruses and bacteria to monochromatic ultra-violet radiation and on the control of airborne contagion in day schools although lack of reliable epidemiological data has limited the results of the study. Similar studies have been made in crowded military sleeping quarters, where it was shown that the intensity of ultra-violet radiation is of the greatest importance in the control of cross-infection.

FUNGICIDAL AND FUNGISTATIC AGENTS. The increased demand for fungicides in the treatment and control of the spread of dermatophytosis has emphasized the need for standard methods of testing fungicides. Full details are given of one method of considerable promise and for these the original should be consulted.—A. EDEN.

STEVENSON, W. G. (1946.) **The concentration of penicillin in fore milk following intramammary infusion for the treatment of mastitis. Preliminary report.**—*Canad. J. comp. Med.* 10. 82–83. [French summary.] 192

S. determined the concentration of penicillin remaining in the udder of a cow 12 hours after the infusion of 25,000 Oxford units in 100 ml. of water. The fore-milk was pooled and examined by the method of ABRAHAM *et al.* [see *V. B.* 12. R5] and found to contain 14 Oxford units.

The animal was harbouring *Staphylococcus aureus* in two quarters and it is believed that the nature of the bacterial flora determines to a considerable degree how much and how long penicillin remains after infusion. It appears that infusions with 12-hour intervals between are sufficient to ensure adequate concentrations of penicillin in milking cows, and that longer intervals are satisfactory in cows that are drying-off.

—J. W. PULLIN.

DUCA, C. J. & STEINBACH, M. M. (1946.) **Chemotherapeutic observations on tubercle bacilli. Experiments in vitro and in vivo.**—*Amer. Rev. Tuberc.* 53. 594–598. [Spanish summary.] [Authors' conclusions copied *verbatim*.] 193

While the compounds no. 14 (N'-3,4-dimethylbenzoyl sulfanilamide) and no. 18 (2-S, 4-O, pyrimidine) gave complete inhibition of growth at 20 mg. per cent *in vitro* they retarded only slightly the progress of tuberculous infection in guinea pigs, as compared with corresponding untreated controls. Animals treated with diasone, while showing as much tuberculosis as those treated with thiouracil and no. 14, survived longer and maintained a better nutritive condition.

STEWART, J. L. (1946.) **Preliminary observations on the use of phenanthridinium 1553 against trypanosomiasis in the Gold Coast.**—*Vet. Rec.* 58. 193. 194

It is explained that most cattle in the Gold Coast acquire a certain tolerance to trypanosomiasis, but that adverse conditions may cause breakdowns such as frequently occur, for instance, amongst cattle bled weekly for the production of rinderpest serum. Tartar emetic has been used to treat such animals, but has given only temporary benefit.

Thirty-one cattle infected with *T. congolense*, 21 with *T. vivax*, and five with *T. theileri* and two horses infected with *T. vivax* were treated with a single intravenous injection of phenanthridinium 1553, at a dose of 2 mg. per kg. body weight, and remained free from relapses. No toxic symptoms were observed. [The length of time the animals had been under observation is not stated.]—U. F. RICHARDSON.

PARISH, H. E., & RUDE, C. S. (1946.) **DDT to control the winter horse tick [*Dermacentor albopictus*].**—*J. econ. Ent.* 39. 92–93. 195

The D.D.T. emulsion used in this work was made by dissolving 1 part by weight of D.D.T. in 5 parts of soluble pine oil and stirring 6 fl. oz. of this stable concentrate into 1 gal. water immediately prior to application, giving a concentration of approximately 0.8% D.D.T. The emulsion was applied by means of a sponge, the amount required per horse varying from 2 quarts to 2 gal. depending on size, length of hair, etc.

One week after treatment of 175 horses, 83% were free from ticks, 16% had a few ticks and 0.5% were still heavily infested, the failures being ascribed to inefficient application, many of the animals resisting treatment to such an extent as to make thorough application impossible.

The average period of protection from reinfestation was 45 days, but of the horses treated 26% remained free from ticks during the whole of the ensuing tick season from November to the middle of March. A total of 68 retreatments was required to protect the entire group from serious reinfestation.

It was noticed that nymphs might be present at one observation and the animal be tick-free at the following observation; as cast skins were found on the hair when no live ticks could be found, it is suggested that D.D.T. may have a residual effect on the emerging adults. No harmful effects were noticed even in working animals.

—U. F. RICHARDSON.

BRIZARD, A. (1943.) **Le benzoate de benzyle dans le traitement des gales du cheval. [Benzyl benzoate in the treatment of mange in horses.]**—*Rev. Méd. vét., Lyon et Toulouse.* 94. 267–274. 196

Benzyl benzoate was applied neat, or dissolved 1 : 5 in olive oil, or in an emulsion contain-

ing equal parts of the drug, soft soap and 90% alcohol, to the moist skin in the region of the lesions after clipping and washing. Application was by vigorous use of a brush, softening and raising the crusts. This procedure was repeated after one hour and next day the horse was washed and groomed.

Three cases of sarcoptic, five of psoroptic and two of chorioptic mange were completely cured, as confirmed by microscopic examination of scrapings.—T. SPENCE.

DAVIDSON, J. La V. (1945.) **Treatment of demodectic mange in dogs.**—*Vet. Med.* 40. 377-378. 197

D. found that a 33% solution of benzyl benzoate, in an aqueous vehicle containing 51% alcohol, applied with massage to the clipped lesions on the animal still damp after a soap bath and repeated three times at three-day intervals cured demodectic mange of dogs. Diagnosis and confirmation of clinical cure was based on microscopic examination of deep scrapings. He recommends the provision of adequate dietary supplements. Although the drug is tolerated well by dogs, some cats may show toxic symptoms.

—T. SPENCE.

*MARSH, H. (1944.) **Phenothiazine treatment.**—*Montana Wool Grower*. 18. No. 12. 9 & 18. [Abst. in *Biol. Abstr.* Sect. F. 19. No. 5. 34, slightly amended. Signed: C. E. TERRILL.] 198

Drenching range ewes in the winter with phenothiazine is not necessary in areas where sheep will take salt freely in the spring and summer. Results of pasture experiments with 100 ewes indicate that the use of salt containing 10% phenothiazine in the spring and summer is adequate to protect lambs from stomach worms and intestinal round worms.

GUILHON, J. (1945.) **Traitement du parasitisme intestinal des oiseaux par la thiodiphénylamine.** [Phenothiazine as an anthelmintic for poultry.]—*Bull. Acad. vét. Fr.* 18. 101-111. 199

G. treated six pigeons badly infested with *Ascaridia columbae* and *Capillaria* sp. with increasing doses of phenothiazine. *Ascaridia* was completely removed and *Capillaria* incompletely, as assessed by faecal examination, by total doses of between 1.5 g. per 385 g. body weight and 4.25 g. per 453 g.

When six cocks more or less severely infested by *Ascaridia lineata* and *Heterakis gallinae* were given phenothiazine in total dosage of 0.25-6.0 g., the faeces contained no worm eggs 20 days after treatment. Five hundred fowls from the same farm given individual doses of 0.5 g. phenothiazine

mixed in 100 g. mash voided many worms and improved greatly in condition.

In three outbreaks of enteritis in turkeys, suspected to be blackhead due to *Histomonas meleagridis*, deaths stopped when phenothiazine was given at the rate of 1.25 g. per kg. body weight or by six doses of 0.3 g. per bird.

Two flocks of fowls infested by *Davainea proglottina* were given 2.5-5.0 g. phenothiazine per bird and deaths stopped. The drug was ineffective in avian coccidiosis.

[G.'s trials were insufficiently controlled for his results to be accepted in all cases: many technical data of interest are lacking. His claim for action against *Davainea* is not borne out by the experiences of other workers on cestode infestations.]—J. E.

*BERNSTEIN, H. I., & ROTHENSTEIN, L. R. (1944.) **Phenothiazine chemistry. I. 10-sulfanilyl-phenothiazine and other 10-substituted phenothiazine derivatives.**—*J. Amer. chem. Soc.* 66. 1886. [Abst. in *Stain. Tech.* 20. 64, copied *verbatim*. Signed: A. P. BRADSHAW.] 200

In connection with the search for antimalarials, certain 10-substituted phenothiazines were prepared for testing because of the structural similarities existing between atabrine, p,p'-bis-(acetylamino)-diphenylsulfone, methylene blue, phenothiazine and phenothiazine sulfone. The first three of these compounds have been found to possess antimalarial activity. The pharmacological findings on the compounds prepared will be reported later.

ROSKIN, G. (1946.) **Toxin therapy of experimental cancer. The influence of protozoan infections upon transplanted cancer.**—*Cancer Res.* 6. 363-365. [Author's summary copied *verbatim*.] 201

Cancer cells may be particularly sensitive to certain protozoan endotoxins and bacterial toxins, while normal cells of a given animal species are immune. Some bacterial toxins and protozoan endotoxins in adequate dosages inhibit the development of certain experimental tumors and cause complete regression of others. Toxin therapy may become one of the methods for treating malignant tumors.

WILLIAMS, W. L. (1946.) **The effects of suramin (germanin), azo dyes, and vasodilators on mice with transplanted lymphosarcomas.**—*Cancer Res.* 6. 344-353. [Author's summary and conclusions copied *verbatim*.] 202

The azo dyes had no effect upon the growth or morphology of transplanted lymphosarcomas, but prolonged the bleeding and clotting times. The vasodilators (histamine and depropanex) did not effect tumor growth; in these mice and in

the untreated controls the weights of the tumors ranged from 7 to 16 gm. (av. 10.9 gm.).

In the suramin-treated mice the tumors weighed 1 to 7 gm. (av. 3.5) and the inhibition of their growth apparently resulted from the necrosis of neoplastic lymphocytes, but morphologically normal tumor cells were still present. In the lymph nodes and spleens of these animals there was an obvious diminution in the number of lymphocytes, the usual lymphoid areas of these organs consisting almost entirely of reticular cells, fibroblasts, large lymphocytes, and plasma cells. The lymph nodes showed much less actual necrosis of lymphoid elements *in situ* than did the tumors. Bleeding and clotting times were prolonged, and in most cases there was renal damage.

Tissue from 2 tumors that grew in suramin-treated animals was successfully transplanted to 10 other C3H mice, thus demonstrating the presence of viable neoplastic cells.

Smaller doses of suramin given immediately after transplantation did not significantly inhibit the eventual growth of the tumor.

WALCH, J. (1943.) Der Gipsverband zur Behandlung des Hufkrebses. [Treatment of canker in horses with plaster of paris bandaging.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 132. 203

W. obtained good results with the conventional operation, dressing with a mild corrosive solution of zinc chloride, boric acid and borax or salicylic acid and a pressure dressing of plaster of paris, left on 2-3 weeks. His method is suitable for cases of canker limited to the frog and sole. —J. E.

HAUBRICH, L. R., & HAUBRICH, W. R. (1946.) Report on the use of a new acid-ester preparation in certain dermatological conditions in animals.—*J. Amer. vet. med. Ass.* 103. 169-171. 204

The authors report the successful use of a new proprietary preparation containing the propylene glycol esters of malic, benzoic and salicylic acids in a propylene glycol-water medium against foot-rot [necrobacillosis] in cattle and sheep, ringworm in cattle and eczema and ear canker in dogs. Typical case reports for each condition are given in detail.—A. EDEN.

RENAULDON. (1942.) Anesthésie générale au chloral citraté dans l'espèce bovine. [General anaesthesia in cattle with chloral in citrate.]—*Rec. Méd. vét.* 118, 29-30. 205

Satisfactory anaesthesia can be induced in cattle by the intravenous injection of 12 g. chloral hydrate per 100 kg. body weight, as a saline sodium citrate solution of chloral hydrate. The animal may be brought quickly to its feet after

an operation by the slow intravenous injection over an interval of 5 min. of cocaine hydrochloride (0.3 g. in 20 ml. of water).—E. COTCHIN.

*MEYER, S. (1942.) Worauf beruht die gewebsschädigende Wirkung des Chloralhydrat als subkutane Komplikation intravenöser Chloralhydratinfusionen? [The cause of the tissue-damaging effect of chloral hydrate as subcutaneous complication of intravenous chloral hydrate infusions.]—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 55.] 206

The drug was injected into horses in the subcutaneous tissues of the neck and was recovered many hours after. It is concluded that chloral hydrate unites with the tissue serum proteins. The drug acting on the tissue proteins causes precipitation and denaturation and this is responsible for the complications of chloral hydrate infusion. Severe complications may be due to impurities in the solution, to concentrations too high, to technical errors in the infusion technique or to failure to observe full aseptic precautions. —J. M. ROBSON.

STRAKOSCH, R. (1945.) The treatment of oesophageal obstruction, or "choke" in the ox by paravertebral anaesthesia.—*Aust. vet. J.* 21. 40-41. 207

Two cases were treated successfully by injecting 30-40 ml. of 0.15% percaïne, containing 2% of adrenalin, subcutaneously into the left atlantal fossa and 20-40 ml. intramuscularly over the 4th-6th cervical vertebrae. The relaxation of the oesophageal muscles results in the movement of the obstruction.—D. C. BLOOD.

BRAZIL, O. V., SEBA, R. A., & CAMPOS, J. S. (1944.) Propriedades curarizantes dos alcaloides alcali-insolúveis metilados do *Chondrodendron platyphyllum* (St. Hil.) Miers. [Curare-like action of alkali-insoluble methylated alkaloids from *Chondrodendron platyphyllum*.]—*Bol. Inst. Vital Brazil.* No. 26. pp. 8-22. [English summary.] 208

Substances resembling curare, but less potent in their paralytic action, can be extracted from *Chondrodendron platyphyllum*. These substances, alkali-insoluble-alkaloids, differ in their action from curare in several respects, but their mode of causing paralysis is probably the same.

Methylation of the alkaloids increases their potency more than tenfold, and makes them superior to curare. Prostigmin has an antagonistic action, in the rat, to both curare and these methylated alkaloids and it may save the lives of paralysed rats. This suggests that the alkaloids do not possess an intense collateral toxic action on the circulatory system.

The mouse, rat and pigeon vary in their susceptibility to curare and methylated alkali-insoluble alkaloids.—ISOBEL W. JENNINGS.

SELLNICK, K. (1943.) Erfahrungen mit dem neuen Narkosemittel R 1248 U (Rapidorm). [The narcosis-producing drug R 1248 U (rapidorm).]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 365-366. 209

Rapidorm appears to be a 25% solution of secondary amyl-allyl-N-methyl-barbituric acid and is injected intravenously. A number of operations under this anaesthetic are described. In 34 years of practice, S. has used no better or more convenient preparation.—J. M. ROBSON.

CARLSTRÖM, B., & LÖVGREN, O. (1941.) Kliniska iakttagelser angående behandling av reumatiska sjukdomstillstånd med muskeladenylsyra och adenylypyrofosforsyra. [Clinical observations respecting the treatment of rheumatismal conditions by means of muscle-adenylic acid and adenosine triphosphate.]—*Skand. VetTidskr.* 31. 513-538. [English summary.] 210

The authors give the records of 27 cases of disease in man treated with muscle adenylic acid and adenosine triphosphate. Best results were obtained in two cases of myalgia, two of sciatica, one of diabetic neuritis and 18 of polyarthritis of varied type.

From their experiences the authors conclude that used therapeutically, these substances correct a defective carbohydrate metabolism of the affected tissue, through an enzyme reaction concerned with phosphorylation.

It is interesting to report that in some of the above cases psoriasis was also present and that this skin condition likewise cleared up with the joint or nerve trouble.—J. E.

*GROTE, R. (1943.) Fasten als Heilbehandlung. [Fasting as a method of treatment.]—*Forsch. Fortschr.* p. 365. [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 814.] 211

Fasting leads to an excretion of metabolic products. The increased elimination of NaCl sets water depots in motion and decreases oedema. The alkali reserve of the blood is decreased. It is claimed that fasting increases healing processes and alters the action of drugs; fasting has actions similar to many drugs, e.g., strophanthin.—J. M. ROBSON.

VANSELOW. (1944.) Zur Behandlung des Festliegens post partum. [Treatment of post-parturient paralysis in cows.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 308. 212

Two animals were treated with a combination of cardiazol (leptazol) and ephedrine and recovered.—J. M. ROBSON.

DRILL, V. A., & LOOMIS, T. A. (1946.) Effect of methionine supplements on hepatic injury produced by carbon tetrachloride.—*Science.* 103. 199-201. 213

Supplements of methionine are known to decrease the degree of liver damage produced by toxic agents in animals on a protein deficient diet. The present studies were made to determine whether the same protective action follows when animals are maintained on a normal protein intake.

Groups of dogs were given normal protein diets containing 20 and 41% casein. Liver damage was induced by administration of carbon tetrachloride and subsequent hepatic function was assessed by standard bromsulphalein retention and serum phosphatase determinations. It was found that injections of methionine failed to decrease the degree of hepatic damage under the conditions of a normal protein dietary regime.—A. EDEN.

MOORE, G. R. (1946.) Effects of stilbestrol on pyometra following retained fetal membranes.—*J. Amer. vet. med. Ass.* 108. 153-156. 214

Forty-three cows with pyometra following the manual removal of retained placentae were treated with diethylstilboestrol (30-50 mg. intramuscularly) two weeks after the removal of the placentae. Within 72 hours there were signs of oestrous behaviour in all but two animals and pus was discharged from the uterus. The two cows which did not respond were given a second injection. All the cows were mated at the first oestrous period after the 60th day following parturition and were bred at each successive oestrus until conception occurred. Forty-two of the cows were pregnant by the 140th day after parturition. The average time from parturition to conception was 86.2 days.

Fifty cows suffering from retention of the placenta and subsequent pyometra were similarly treated, except that stilboestrol was entirely withheld. In this control group the average time from parturition to conception was 144.8 days.

It is concluded that in the treatment of pyometra which follows the manual removal of retained placenta in the cow, stilboestrol has a marked therapeutic value.

The authors stress the uncritical nature of many of the reports on the use of stilboestrol in cattle practice and the necessity for more controlled experiments.—ALFRED T. COWIE.

FLOREY, M. E., TURTON, E. C., & DUTHIE, E. S. (1946.) Penicillin in wound exudates.—*Lancet.* 251. 405-409. [Authors' summary copied verbatim.] 215

A method for preparing wound exudates for assay of their penicillin content is described. Sources of error from other inhibitory factors and

from contaminating bacteria are thereby eliminated.

A dose of 100,000 units given intramuscularly to severely injured battle casualties whose wounds were 4-61 days old invariably produced inhibition for 8 hours in the wounds tested, and for 12 hours in 50% of cases. A dose of 100,000 units given locally into wounds 9-67 days old invariably produced inhibition for 48 hours in the wounds tested, and for 60-72 hours in 50% of cases. These time-limits were irrespective of the age, bacterial flora, pH, or consistence of the wound exudates. Blood and urine assays were correlated with these findings and served to confirm them.

A possible application of these findings to the treatment of focal infections is mentioned. The advantages of local over intramuscular administration in prophylaxis and treatment are also discussed.

BURTENSHAW, J. M. L. (1945.) **Self-disinfection of the skin: A short review and some original observations.**—*Brit. med. Bull.* 3. 161-164. 216

Disinfection in the depths of the skin, as in all tissues, occurs through the defensive action of inflammation and humoral immunity; although localized immunity can be induced to certain organisms, it is, in general, non-specific and most probably due to a more efficient inflammatory process. Disinfection of the skin surface can result from (1) desquamation and certain physical attributes of the epidermis, (2) desiccation, (3) acidity of the skin, (4) fatty acids and (5) certain bactericidal agents. The acidity of the skin results from sweat which contains organic acids

such as lactic acid and the fatty acid series. Other possible bactericidal agents acting on the skin are menotoxin, ultra-violet radiation, lysozyme and lipoids. Some original observations on self-disinfection of the skin are described, including experiments on the possible relationship of the sterilizing substance in skin and hair to lysozyme, although it appears unlikely that lysozyme and the higher fatty acids, are in any way nearly related. It seems probable that the whole range of fatty acids from formic to stearic (and oleic) acids, and to a lesser degree their soaps, are very important agents as disinfectants of the skin surface.—A. EDEN.

Bos, A. (1943.) **Het desinfecteerend vermogen van kresyline op enkele bacteriënsoorten. ["Kresyline", a new disinfectant.]**—*Tijdschr. Diergeneesk.* 70. 55-59. [English, French & German summaries.] [English summary slightly amended.] 217

The bactericidal effect of "kresyline", a coal tar derivative, against *Bacterium coli*, *Bact. equirulis*, *Staphylococcus aureus*, *Streptococcus pyogenes* and *Salmonella dublin* was equivalent to or better than that of creolin and better than that of carbolic acid, a 1% solution killing cultures within 2 min.

Its bactericidal effect against the causal organisms of blackleg and anthrax was equivalent to that of creolin but less than that of carbolic acid. A 10% "kresyline" solution killed *Clostridium chauvoei* within 30 min. and *Bacillus anthracis* within two days. The latter remained viable seven days after treatment with 10% creolin.

See also absts. 23 (treatment of bacterial venereal disease of sheep), 99 (treatment of myiasis), 104 (treatment of *Dirofilaria* infection), 178 (vascular degeneration, treatment of), 261 (penicillin).

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

WITTE, J. (1943.) **Ueber die Beurteilung des Keimgehaltes anlässlich der bakteriologischen Fleischuntersuchung. [On the estimation of bacterial content in bacteriological meat inspection.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 66-69. 218

W. comments on the significance, in the light of the German meat inspection laws, of finding aerobic and anaerobic bacteria in meat, and discusses the advisability of altering some of the regulations.—J. E.

WARD, T. K. (1945.) **Meat and food inspection in the Middle East.**—*J. R. sanit. Inst.* 65. 205-206. 219

W. describes his duties as a hygiene assistant during the war in the Middle East, with especial reference to meat inspection in Upper Egypt.

The cattle examined by him all appear to

have been Sudanese imported into Egypt. One third of the cattle were infested with *Oesophagostomum columbianum* and one-half were affected with pleurisy and/or pneumonia of some kind or other. The only notifiable disease encountered was contagious pleuro-pneumonia, but its incidence was low. [It seems doubtful if this disease was, in fact, present to any appreciable extent in the imported cattle: the lesions of chronic pneumonia in the ox frequently simulate those of contagious pleuro-pneumonia.]

W. states that TB. was rare in these cattle, and then usually generalized. [Over a period of more than 20 years, in which many thousands of Sudanese cattle slaughtered in quarantine at the Cairo and Alexandria abattoirs were examined, the abstractor found no TB., although the disease was very common in the Egyptian cattle.]

The examination of sheep is also described.

Fowl typhoid is said to be very common in Egyptian poultry.—D. S. RABAGLIATI.

CHRISTIANSEN, M. J., & JEPSEN, A. (1945.) Om Tuberkelbakteriers Forekomst i Afløbsvand fra Slagterier, Mejerier og Destruktionsanstalter. [Presence of tubercle bacilli in waste water from abattoirs, dairies and carcass disposal plants.]—*Maanedsskr. Dyrlaeger*. 57. 173-193. 220

This report describes work following that detailed at the fifth Scandinavian veterinary congress [see *V. B.* 10. 788]. Waste water from 17 dairies was tested by animal inoculation for the presence of tubercle bacilli, but results were negative even though most of the herds from which the milk came were infected.

Samples of water from a stream into which waste water ran from an abattoir, were taken at several points, up to 4,000 metres distant from their place of entry and bovine tubercle bacilli were recovered from four, including one taken at the maximum distance. Avian type tubercle bacilli were also recovered from one sample. After these observations four successive experiments were carried out with a total of 23 cattle which were put on a pasture adjacent to a stream at a point 3.5 km. below point of entry from the same abattoir drain. They were either watered from a cistern supplied from the stream or were allowed to drink direct from the stream. None of the cattle developed reactions to the tuberculin test.

The authors conclude that there is very slight danger of infection with TB. to animals drinking water contaminated with waste water from dairies, abattoirs and carcass destruction plants. However, they consider that such factors as the nature of the stream or river and the speed of flow may be important factors.—J. E.

WILSON, G. S. (1944.) **Staphylococcal food poisoning.**—*Proc. Soc. agric. Bact.*, 1944. pp. 72-74. 221

W. summarizes generally what is known of the subject. The exact nature of the toxin and its relation to lysin, leucocidin and other staphylococcal toxins are not understood: laboratory diagnosis is seldom conclusive unless toxin prepared from the food strain of staphylococcus can be shown to have given rise to gastro-enteritis in human volunteers.

Typical outbreaks of staphylococcal food poisoning have rarely been traced to milk, probably as a result of the competitive effect of other organisms.—J. C. BUXTON.

MACDONALD, A. (1945.) **Food poisoning.**—*J. R. sanit. Inst.* 65. 171-174. 222

The two common types of food poisoning are chemical and bacterial. Zinc poisoning has

been especially prevalent during recent years: it is usually caused by cooking or soaking acid foods in galvanized containers. Bacterial poisoning is of two types, the toxin type and the infective type. In the toxin type, bacterial toxins are present in the food before it is eaten. In the infective type, bacteria present in the food infect the subject eating it. In the first type, patients become ill within a few hours of eating but almost invariably recover within a few days: the causal agent is usually *Staphylococcus aureus*. The second type is associated with *Salmonella* organisms which 6-14 hours or longer after eating cause severe illness, often fatal, especially among very young and old patients.—D. D. OGILVIE.

BUCHBINDER, L., SOLOWEY, M., & SOLOTOROVSKY, M. (1945.) **Comparative quantitative studies of bacteria in air of enclosed places. Part I of air pollution survey report.**—*Heat. Pip. Air Condit.* 17. 389-397. [Abst. in *Bull. Hyg., Lond.* 20. 698, copied verbatim. Signed: ROBERT CRUICKSHANK. 223

The bacterial content of air, as determined by the use of plain and blood-agar cylinders in the Wells air centrifuge, was investigated in six schools, in subway cars, in air-conditioned and non-air-conditioned theatres, in the street and in Central Park, New York City. Samples were taken under different conditions of crowding, ventilation and season. Analysis showed that the highest counts were obtained in schools (average 23.8 organisms per cu. ft.), next in the subway cars (14.8) and non-air-conditioned theatres (10.6), next in streets (8.9) and lowest in air-conditioned theatres (2.5) and the Park (2.4). There was little seasonal variation. In the schools, the highest counts were found in occupied assembly rooms, in the corridors and in occupied classrooms, and higher counts were obtained in old, badly ventilated and overcrowded schools than in more modern schools. In the subway cars, the bacterial counts were highest during the morning rush hour, dropping steadily to 12 noon and rising slightly between 12 and 1 p.m. when the cars were again more crowded. It is noteworthy that the bacterial content of the air of cars packed to capacity was considerably lower than that of occupied assembly or classrooms at school. Better ventilation of the subway cars in motion is the possible explanation. Comparisons of the total bacterial and *Str. viridans* counts showed a fairly steady ratio, around 100:1, and it is suggested that the total bacterial count, which is more easily determined, can be used as an index of atmospheric pollution.

ANON. (1945.) **Medical [and veterinary] education in Germany.**—*Bull. U.S. Army med. Dep.* 4. 540-544. 224

The Veterinary Institute at the University of Leipzig was almost completely destroyed by bombing. During the war years students received a diploma for the practice of veterinary surgery after four and a half years' study. The degree of Doctor of Veterinary Medicine was conferred after presentation of a thesis which required extra work for a period of six months to one year.

—D. D. OGILVIE.

LI, P. J. (1942.) [Report of the work on animal insurance during 1939-1940 in San-Hsia dis-

trict of Szechwan Province.]—*J. Szechwan agric. Res. Sta.* 4. No. 6, 7 & 8. 97-130. 225

An insurance scheme for pigs was first introduced into this district in August 1939. Every pig submitted for insurance by the farmers had to pass a physical examination and be subject to every measure of disease prevention specified by the District Office. This was found to be the most effective way of enforcing control measures against animal diseases. During 1939-40, 1,124 pigs were registered for insurance, their death roll totalling only 6.5%.—S. J. CHU.

See also absts. 5 (casein number of milk), 16 (occupational TB.), 47 (brucella in milk), 49 (Malta fever prevention), 53 (clostridium toxins), 66 (leptospirosis in man), 70 (foot and mouth disease in man), 87 (poliomyelitis virus in sewage).

TECHNIQUE AND APPARATUS

CORPER, H. J., & COHN, M. L. (1946.) Combination egg media for the diagnostic culture of tubercle bacilli.—*Amer. Rev. Tuberc.* 53. 575-582. [Spanish summary.] [English summary and conclusions copied *verbatim*.] 226

The addition of potato or potato products to egg-yolk does not appear to add any value to the latter as nutrient for human or bovine tubercle bacilli and is unessential for diagnostic culture for tubercle bacilli.

The addition of malachite green in concentration of 0.01 to 0.1 per cent to egg media tends to retard particularly the growth from small plantings of human and bovine tubercle bacilli. In these concentrations, the dye acts as a static agent but not as a cidal agent. In the close proximity of colonies of mammalian tubercle bacilli, the malachite green in egg-yolk or Petragnani's medium is reduced and loses its color, thus leading to possible error in reading cultures.

Petragnani's multiple mixture medium does not appear to be as good a nutrient for the growth of small plantings of mammalian tubercle bacilli as the simple egg-yolk medium, apparently because of the slight retarding effect of the malachite green. Economically, it is less easily prepared consistently.

If color contrast is desired in a nutrient medium for the diagnostic growth of small numbers of mammalian tubercle bacilli, such coloring material should be of the most striking contrast value. This dye should be nonstatic and stable. It should be incapable of reduction or discolorization by the growing bacilli. It should not color the tubercle bacilli themselves. Such a dye is now in contemplation.

FAGUET, M., & NITTI, F. (1943.) Enregistrement continu des courbes de croissance microbiennne a l'aide du microbiophotomètre. [Continuous recording of bacterial growth curves by

means of the microbiophotometer.]—*Ann. Inst. Pasteur.* 69. 126-128. 227

The authors describe a microbiophotometer which is capable of recording the bacterial growth curves of six separate cultures. Technical details are given of the source of illumination, temperature regulation and the method of aerating the cultures. The opacities of the cultures are measured by means of a photoelectric cell and potentiometer.—D. L. HUGHES.

JONES, L. R. (1945.) Serologic agglutination of antigen-coated dye particles.—*Proc. Soc. exp. Biol., N.Y.* 59. 124-128. 228

By adsorption of equine serum (antigen) to particles of carmine of suitable size, a suspension can be prepared which is specifically agglutinated by rabbit anti-horse serum (antibody). The process can be reversed, antibody-coated particles being agglutinated by antigen. With suitably prepared suspensions, aggln. tests can be conveniently carried out by the open slide method, whereby it is possible to detect antibody in the fresh sera of immunized rabbits 2-6 days earlier than by the conventional antigen dilution method.

—H. S. McTAGGART.

MAYER, M. M., EATON, B. B., & HEIDELBERGER, M. (1946.) Spectrophotometric standardization of complement for fixation tests.—*J. Immunol.* 53. 31-35. 229

A method is described for the estimation of a unit of complement, representing 50% haemolysis, based on the use of a Coleman spectrophotometer. The unit is determined by a simple graphical method. In brief, a standard haemoglobin solution is prepared by the lysis of a sheep red cell suspension containing one million per cu. mm. To estimate the 50% unit of complement a suitable system of red cells and amboceptor with falling dilutions of complement is set up. After lysis the tubes are centrifuged and the density of

the supernatant haemoglobin solution is estimated in the spectrophotometer.—R. E. GLOVER.

TURNER, A. W. (1944.) **The successful preservation of *Anaplasma centrale* at the temperature of solid carbon dioxide.**—*Aust. vet. J.* 20. 295–298. 230

Infected citrated blood that had been quickly frozen and maintained at -72°C. to -80°C. for 254 days was infective at a dosage of 1–2 ml. to two calves. The implications of maintenance of the organism for so long a period are discussed.

—N. WICKHAM.

LITTLE, P. A., & SUBBAROW, Y. (1945.) **A practical liquid medium for cultivation of *Trypanosoma cruzi* in large volumes.**—*J. Bact.* 50. 57–60. 231

In standard media for *T. cruzi* the water of condensation is the most favourable portion, but this fluid is small in amount, and tubes must be capped to conserve it. The medium now described consists of 100 mg. of dry coagulum of red blood cells, covered with 5 ml. of a solution made by dissolving 20 g. bactopectone, 5 g. sodium chloride and 2 g. glucose in 1 litre distilled water; 3 ml. normal sodium hydroxide are added to adjust the pH to 7.5.

The r.b.c. coagulum is prepared by pouring 100 ml. of fresh rabbit r.b.c. into 1 litre of rapidly boiling water, the boiling being maintained for 10 min. The coagulum is collected on cheese cloth filters while hot, transferred to trays lined with absorbent paper, and dried for 48 hours at 37°C. The coagulum is stirred at intervals to aid the formation of small granules and when dried is ground in a pestle and mortar. It can be stored indefinitely in a dry place.

The medium can be used for determining the chemotherapeutic activity of drugs against *T. cruzi* and for the preparation of *T. cruzi* antigens. The red cell granules can be replaced by refined preparations of thrombin, egg albumin, serum albumen and pseudoglobulin, but not by fibrinogen or casein.—U. F. RICHARDSON.

HOFFSTADT, R. E., & TRIPI, H. B. (1945.) **A small jar for grinding tissue to be used with the Waring blender.**—*J. Bact.* 50. 676–678. 232

[Authors' summary copied *verbatim*.]

Grinding in this type of jar (1) has the advantage of speed, since the time of grinding by hand, $\frac{1}{2}$ to 1 hour, has been reduced to 1 to 2 minutes; (2) obviates the necessity for the use of sterile pyrex; (3) permits the grinding of small amounts of tissue in small amounts of diluent; (4) has the advantage of grinding at high rpm (12,800 to 14,000) without spattering over the edge of the cup (the highest for any instrument previously recorded was 5,000 to 6,000 rpm by Alford

and Palmes); and (5) eliminates the possibility of breakage and loss of material as in the glass containers described by Corper and Cohn and by Potter and Elvehjem.

CONN, H. J. (1945.) **Progress in the standardization of stains. The work of the Stain Commission.**—*Stain Tech.* 20. 105–112. 233

The number of samples tested annually by the Commission rose to a maximum in 1942 (157 samples tested; nine rejected), which was three times the number in any pre-war year. In 1944 the annual number of tests fell to 79, ten samples being rejected. Over the four five-year periods during 1925–44 the percentage of samples rejected fell from 9.3 to 6.4. The demand for certificated stains also rose steadily, reaching a maximum in 1942–43 and then declining as the war-time demand fell off.

Post-war plans of the Commission include the stimulation of research with a view to the development of new stains and new methods and the improvement and standardization of existing methods.—H. S. McTAGGART.

ANON. (1946.) **Substage slide marker.**—*Bull. U.S. Army med. Dep.* 5. 381–382. 234

The device consists of a cap of plastic or other material moulded to fit over the substage condenser and to rest on its most suitable ledge. The apex of the cap is flattened and a letter "O" from a rubber stamp about the size of the low-power field is secured to it. After centering, which is carried out with the aid of crossed hairs placed on the microscope stage and centred through the high-power objective, the condenser with the cap is remounted. The field is marked by inking the marker, placing it over the condenser and raising the condenser until the marker touches the slide.—H. S. McTAGGART.

STEEDMAN, H. F. (1945.) **Ester wax: a new embedding medium.**—*Nature, Lond.* 156. 121–122. 235

A search among natural and synthetic fatty acid esters for an embedding medium more suitable than paraffin wax yielded no single substance which fulfilled all the requirements, but the following mixture was suitable for most purposes: 82 g. diethylene glycol distearate; 4 g. ethyl cellulose, low viscosity; 5 g. stearin; 9 g. ricinoleic (octadecanediol) diacetate. This has a m.p. of 48°C. , a section range of 4–20 μ , and a ribbon range of 4–15 μ at room temperature (66°F.).

Ricinoleic diacetate is unobtainable in Britain, but may be prepared from ricinoleic alcohol and acetic anhydride; alternatively castor oil may be used.

Ester wax is soluble in most organic solvents and in the following, which also act as clearing

agents:—dioxan, ethylene glycol monoethyl ether ("cellosolve"), ethylene glycol monobutyl ether, diethylene glycol monobutyl ether and cedarwood oil.

The embedding technique is similar to that involved with paraffin wax.

The most important feature of ester wax is that "ribbon staining" may be employed, in which the sections are flattened not on water but on a staining solution which easily penetrates the wax and stains the tissue. The sections may be de-waxed and differentiated with a mixture of equal volumes of ethyl acetate and xylol containing "cellosolve", the proportion of which depends on the degree of differentiation required. The counterstain is applied in solution in a similar mixture containing 20% "cellosolve".

Various stains may be employed, but so far methylene blue, with erythrosin as counterstain, has proved most satisfactory.

A list is given of the firms from which the various reagents can be obtained.—H. S. MCT.

RUTH, E. B. (1946.) **Demonstration of the ground substance of cartilage, bone, and teeth.**—*Stain Tech.* 21. 27–30. [Author's summary copied *verbatim*.] 236

A method is described for demonstrating the fibrillar structure of decalcified bone by washing out the amorphous collagen with a 3% KOH solution to which some glycerin is added. When dissociation of the ossein has progressed far enough the specimen is embedded in paraffin and sections are cut at 10μ to 12μ . The fibrillae are stained with orcein or picrofuchsin. These stains show a selective specificity that permits a differential staining of the diffuse and compact lamellae in bones having Haversian systems. Bones that do not show such a well-oriented fibrillar structure do not have this differential staining reaction. The use of Ponceau B instead of fuchsin in Van Gieson's stain is suggested to circumvent the tendency of the stain to fade.

MACMAHON, H. E., & DELVECHO, S. B. (1944.) **A simple technic for rapid sectioning.**—*New Engl. J. Med.* 231. 794. 237

For examining tissues for diagnostic purposes at the time of operating, a rapid method is described which requires a minimum of apparatus.

The basis of the method is the staining of a thin layer of fresh, unfixed and unfrozen tissue with a stain that is kept as a thin dry film on the surface of a glass slide instead of in a liquid state. The slide is coated on one side with Mayer's albumen-glycerin mixture and then dipped for a few sec. in a 1% aqueous solution of toluidine blue. It is then drained, the reverse side is wiped clean and it is allowed to dry on a flat surface.

These prepared slides keep indefinitely. A thin section of the tissue is cut with a razor blade and placed gently on the ball of the finger. The stained slide is drawn lightly and quickly across the section, staining only one surface of the tissue. The section is immersed in water, mounted on a slide with the stained surface uppermost, covered with a coverslip and examined. It is claimed that the results are as good as those obtained by the usual freezing technique.—M. C.

GESSLER, A. E., & FULLAM, E. F. (1946.) **Sectioning for the electron microscope accomplished by the high speed microtome.**—*Amer. J. Anat.* 78. 245–279. [Authors' summary copied *verbatim*.] 238

High speed microtome sectioning of biological material is described. It is possible to produce sections of a fraction of a micron in thickness. These are thin enough to be used in the electron microscope. Sections of the usual thicknesses for the light microscope can also be obtained. Methods of tissue fixation and embedding are given.

The use of a new class of embedding materials which volatilize by sublimation and which eliminate the drawback of extraction by solvents is described. The novel possibility of using ice for embedding and slicing purposes may open some new phases of microscopical research.

A number of micrographs are given which illustrate the successful technique of high speed microtome sectioning as well as the necessary auxiliary techniques, particularly fixation, embedding and section collecting. The figures indicate some of the fields of application of the new microtome.

CONN, H. J., & DARROW, M. A. (1945.) **Substitutes for ethyl alcohol.**—*Stain Tech.* 20. 115–117. [Authors' abstract slightly amended.] 239

Three substitute solvents were investigated as substitutes for ethyl alcohol in nine commonly used staining fluids. Anhydrous methyl alcohol ("Bioid" grade, Will Corporation) and anhydrous 2 B alcohol (a denatured ethyl alcohol) were entirely satisfactory in these fluids, and isopropyl alcohol only slightly inferior.

*LIN, C. Y. (1944.) **A simple glass electrode system for the determination of pH of blood and other biological fluids with temperature control.**—*J. sci. Instrum.* 21. 32. 240

This is a description of an apparatus for determining the pH of blood, designed to prevent loss of CO_2 and heat. The simple glass electrode system including the reference calomel electrode, with temperature control, is easily made. A clear diagram and details of technique employed are given.—E. M. J.

CZEBRINSKI, E. W., SMITH, J. R., NEMEC, S. S., & ROBB, J. A. (1945.) **Measurement of pulmonary arterial pressure in dogs.**—*J. Lab. clin. Med.* 30. 849-853. 241

The dog is anaesthetized with nembutal and, after exposure of the right jugular vein and one common carotid artery, is placed on its left side over the horizontal table of a fluoroscope. A French no. 8 catheter, suitably adapted and provided with a thin steel wire stilette and with a lead in its tip to aid fluoroscopic identification, is then passed through the exposed jugular vein into the superior vena cava and thence into the right ventricle. The wire stilette is then withdrawn slightly and the catheter passed directly into the pulmonary artery, the whole process being facilitated by observation of the catheter through the fluoroscope. The pulmonary arterial pressure is recorded by connecting the open end of the catheter to a Wiggers (optical) manometer while the systemic blood pressure is simultaneously recorded by attaching a cannula inserted into the previously exposed carotid artery to a second manometer. The results conformed generally to those obtained by other investigators using different methods.

Despite the disadvantage that anaesthetization is required, the advantage of the method described here is that it is simple to perform and requires no previous intrathoracic surgical interference.

—H. WILLIAMS SMITH.

SCHNEIDER, R., & BADER, F. (1943.) Eine einfache Methode der gleichzeitigen Bestimmung der Blutsedimentierung und des Volumens der roten Blutkörperchen beim Pferd und Maultier. [Simultaneous determination of sedimentation rate and volume of erythrocytes in horses and mules.]—*Schweiz. Arch. Tierheilk.* 85. 82-96. 242

The sedimentation rate was determined by adding 8 ml. of blood to 2 ml. of 3% sodium citrate solution in a graduated glass tube. Readings of the level of red cells were taken every 10 min. for an hour and then at half-hourly intervals up to three hours. Finally the red cell volume was estimated by a final reading at 24 hours. The cell volume readings gave good correlation with haemoglobin values and the sedimentation rate compared well with the rates obtained by four standard methods. The method is recommended as reliable and simple for clinical work.

—A. T. PHILLIPSON.

I. FARRIS, E. J., CARNOCHAN, F. G., CUMMING, C. N. W., FARBER, S., HARTMAN, C. G., HUTT, F. B., LOOSLI, J. K., MILLS, C. A., & RATCLIFFE, H. L. (1945.) **Animal colony main-**

tenance.—*Ann. N.Y. Acad. Sci.* 46. 1-126. 243

II. RATCLIFFE, H. L. (1945.) **Infectious diseases of laboratory animals.**—*Ibid.* 77-94. Discussion pp. 94-96. 244

I. This number is devoted to the proceedings of a conference held at the Wistar Institute, Philadelphia, to consider the various problems arising from attempts to produce "standardized" animals for research purposes.

In considering genetic purity, HUTT pointed out that the physiologist, pathologist and nutritional investigator require supplies of healthy animals with a minimum of variability. Experiments on diet deficiencies are, for example, difficult to interpret if the gain or loss in weight of one group of animals is not the same as that of another of different breeding. The geneticist, on the other hand, is concerned mainly with variability.

The mutations which arise spontaneously or by planned inbreeding may interfere seriously with the raising of laboratory animals, particularly in respect of lethal genes which may kill the young before birth. They are liable to occur when intense inbreeding is developed, but HUTT considered that such a high degree of genetic purity was not always necessary or desirable, at least in many lines of research. Practical suggestions are made for the establishment of inbred strains.

HARTMAN discussed the methods employed for controlled matings. The first part of his paper was concerned with factors governing oestrus and ovulation and the second with practical methods for securing successful ovulation and mating in the various species, *viz.* rat, mouse, g. pig, rabbit, hamster and larger animals. In the discussion there was a particularly valuable contribution by ZITRIN and BEACH on training cats to mate in captivity. In view of the great difficulty experienced in securing litters in cats kept under highly artificial conditions, the information given is valuable, but it is too long for abstraction and should be consulted in the original by those interested.

The first part of the proceedings on feeding laboratory animals deals in detail with the individual components of satisfactory diets and covers proteins, carbohydrates, fats, minerals and vitamins and is given in the form of an extensive review of the literature. The second half is concerned with practical diets for laboratory animals. Highly purified mixtures which may be adequate for growth are, usually unsatisfactory for breeding animals, particularly rabbits and g. pigs: in breeding animals not only is reproduction less efficient but a lactagogue substance is also lacking.

The importance of yeast in improving such diets is mentioned. The stock diet recommended for rats is composed of 200 lb. ground malted barley, 440 lb. red wheat flour, 300 lb. dried skimmed milk, 300 lb. oat flour, 400 lb. yellow maize meal, 20 lb. steamed bone meal, 20 lb. ground limestone, and 20 lb. salt. Extra vitamins A and B are supplied twice a week but no green food or other supplements are fed. Studies of the nutritional requirements of mice, hamsters and cotton rats suggested that they can be satisfactorily reared on diets suitable for rats. G. pigs and rabbits require green food supplements but can be maintained on very simple mixtures. The diet recommended comprises 2 lb. whole wheat, 2 lb. whole oats, and 1 lb. linseed oil meal, supplemented with mineralized salt, hay and green food.

MILLS emphasized that temperature control in animal environment is essential if experiment results are to be uniform and reproducible. Different examples are given of variations induced by changes in temperature. In mice, a 40% deficit in growth occurs at 90°F. but the animals eat only about half the amount of food consumed by mice held at lower temperatures. Fertility is very low and second generation mice are usually infertile. In regard to the tumours there are marked differences. There is a significant drop in spontaneous mouse breast tumours at 90°F. as compared to 70°F. On the other hand, a much higher incidence of chemically induced or transplanted tumours is seen at 90°F. The effect of temperature level is probably related to tissue metabolism and richness of the blood supply to local areas. Mice kept at high temperatures are less resistant to various organisms, *e.g.*, Type 2 pneumococci and streptococci; they are also hypersensitive to certain drugs, such as insulin and thyroid extract. Similar effects had been seen in larger animals kept under tropical conditions. High temperatures are therefore of importance in animal husbandry, since fertility, milk yields, etc., may be influenced.

The proceedings conclude with sections on finance from the point of view of the university and the commercial breeder. Most of the information is concerned with American conditions and would not apply in other countries.

II. According to R., efforts to exclude infec-

tion from laboratory stock may be unwise as highly susceptible races are liable to arise. Highly resistant strains might, however, be developed by selection after full exposure to common infections. The construction of animal rooms, types of cages, bedding, etc., and the provision of adequate facilities for the isolation of stock suspected to be affected with enzootic diseases are reviewed.

An account is then given of the common infections encountered. The bacterial diseases are considered under the headings of species affected, methods of spread, symptoms and lesions, and methods of control. The conditions covered are salmonellosis, pasteurellosis (*Pasteurella avi-septica* and *Past. pseudotuberculosis*), infectious catarrh of rats and TB. In addition, brief mention is made of pyogenic infections,*pneumonia, etc. In the section on virus diseases no attempt is made to give a detailed description, but a useful list has been drawn up of the viruses responsible for both active and latent infections. Protozoal and parasitological conditions are also adequately covered.

In the discussion ensuing SLANETZ drew particular attention to his methods for the elimination of salmonella infections in rats and mice based on diagnosis by plating faeces on brilliant green agar.—R. E. GLOVER.

SHEPARD, C. C., MAY, C. W., & TOPPING, N. H. (1945.) A protective cabinet for infectious disease laboratories.—*J. Lab. clin. Med.* 30. 712-716. 245

A special box, the construction of which was based on the principles described by VAN DEN ENDE [see *V. B.* 14. 180], has been designed to house electrical equipment such as the Waring blender, which may discharge airborne particles dangerous to man. The important feature is an automatic switch which controls the electrical apparatus and cuts off the power when the sliding window, which gives access to the interior, is raised.

The box is sterilized by ultra-violet lamps and by a powerful extraction system, whereby air is drawn through a heated chimney. The front panel contains two armholes to permit the performance of dangerous operations such as the inoculation of eggs with viruses, the harvesting of infected membranes, etc.—R. E. GLOVER.

See also absts. 152 (sternal puncture), 159 (cystoscopy in cattle), 163 (pregnancy diagnosis), 173 (analysis of faeces).

MISCELLANEOUS

KIRK, H. (1945.) The dyed greyhound case.—*Vet. Rec.* 57. 588-589. 246

K. discusses the salient features of a law suit concerning the dyeing of a greyhound in order that it could be run under a false name.

The dog in question was black and white and it was alleged that the white patches had been dyed black by means of a paraphenyldiamine dye. The prosecution's case was based on the finding of a few dyed hairs 13 and 21 months after

the alleged dyeing had taken place. The defence had to prove that hairs which were growing in January, 1944, could not have been present in February or October, 1945. The normal rate of hair growth, the significance of parti-coloured hairs and the differentiation of natural black pigment from an artificial dye were points at issue.

Evidence was produced to show that while it is very rare for any single hair in a black and white dog to be partly black and partly white, such hairs did occur. It was also argued that such parti-coloured hairs could be produced as a pathological change resulting from local injury or deficiency of the vitamin B complex, particularly of pantothenic and nicotinic acid. On the question of the length of time which elapses between the growth of an individual hair and its shedding, the defence stated that a hair which was present in January, 1944, would be shed before February, 1945, as the shedding of the coat at the time of moulting is a complete process. The prosecution argued that shedding of hair could be a gradual and almost continuous process and that single hairs are continually dropping out and new ones emerging.

The rate of growth of hair in the greyhound was stated to be approximately $\frac{1}{2}$ in. per month.

Examined microscopically, a dyed hair shows a more or less sharp line of demarcation between normal and coloured cells, while natural colour blends gradually into the unpigmented parts. Dye affects mainly the cuticle of the hair, whilst natural pigment invades the cortex.

Detection of *p*-phenylenediamine dye depends upon the ability of formaldehyde to decolorize dyed but not naturally pigmented hair, as described by GRIEBEL & WEISS (1933). The accused was acquitted.—M. C.

I. SCHRECK, H. (1946.) **Reflections on the planning of small animal hospitals.**—*Vet. Med.* 41. 1-15. 247

II. BARSKY, D. (1946.) **Construction and architecture of a small animal clinic.**—*Ibid.* 16-18. 248

These valuable aids to and discussion of the planning of a veterinary hospital for small animals are illustrated by a number of plans and photographs of specimen hospitals.

The unit of a small animal hospital is the kennel, just as the bed is the unit in a hospital for human beings. In planning, the first point to be decided is the number of kennel units required for large, medium and small dogs.

The components necessary for the maintenance of the kennel units are classified as productive and non-productive. Each of the units is required to house a definite selection of fitments,

both built-in and moveable, equipment and instruments. Before deciding upon the measurements of any room the necessary fitments and equipment must be listed.

Building materials, layout, heating and ventilation are all discussed.—M. C.

BARLOW, K. I. (1946.) **Dropping of mules by parachute from Dakota aircraft.**—*J. R. Army vet. Cps.* 17. 93-98. 249

The technique devised and perfected for the dropping of mules from aeroplanes is described and illustrated with photographs.

The mules were cast and supported on a wooden platform measuring 6 ft. 5 in. × 4 ft. To this were attached six "stachutes". Protection against injury was provided by bladders inflated with air lashed under and over the mule. The total weight of the mule platform, etc., exceeded 1,700 lb. Special harness was devised for securing the mule, which was given a small narcotizing dose of chloral hydrate before it was loaded on to the plane. With practice a mule could be packed and loaded on to a plane in 55 min. and could be released and saddled up within 5 min. of reaching the ground.—M. C.

DOBBERSTEIN, J. (1943.) **Ziele und Aufgaben einer vergleichenden Pathologie. [Object of comparative pathology.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* November 12th. 387-390. 250

This is an interesting general account of the scope of comparative pathology.—E. COTCHIN.

— (1944.) **Discussion on the limitations and uses of the comparative method in medicine. V. Comparative psychology and animal behaviour.** [Speakers :- MYERS, C. S., THORPE, W. H., JOHNSTONE-WALLACE, D. B., KENNEDY, K., WALTON, A., HAMMOND, J., STERN, B. S. & CHANCE, M. M. A.]—*Proc. R. Soc. Med.* 37. 658-662. [For part IV, see *V. B.* 15. 398.] 251

This is a discussion on the comparative study of instinct in the various species from insects to man, and the type of learning in different species and its relation to instinct. The management of grazing practices and their relationship to the behaviour of cattle are considered together with the chemical composition of the herbage consumed. The comparative sexual behaviour of males, especially in relation to anatomical structure, and the habits of bulls kept for the collection of semen for artificial insemination are also discussed.

—J. M. R.

MAHER, C. (1946.) **Goats, fire and blowing sands.**—*E. Afr. agric. J.* 11. 179-180. 252

This is a review of a 174-page report by a

committee appointed to report upon soil conservation in the Sudan. Archaeological evidence indicates that no major climatic change has taken place in the past three or four thousand years: any deterioration in the soil and vegetation is therefore attributable to the action of man.

The part which livestock, especially goats and camels, play is discussed. The livestock population is estimated to be three million cattle, six million sheep, five million goats and one million camels, almost entirely owned by nomads. The country is said to be overstocked, but a suggestion that overstocking might be checked by withholding rinderpest prophylactic vaccines was not accepted by the committee. A discriminatory tax on stock was also rejected as a solution. A free cattle health service provided by the Veterinary Service is recommended, on condition that the poorest males be culled each year to keep the number of stock required constant.—M. C.

STEWART, C. M. (1946.) **The muting of animals for General Wingate's force operating behind the Japanese lines in Burma.**—*J. R. Army vet. Cps.* 17. 87-92. 253

Pack ponies and mules were proved by

General Wingate's first Chindit expedition to be essential to the success of such military operations, but their neighing and braying was a serious danger in enemy occupied territory. For his second expedition behind the Japanese lines it was necessary to find some means of "muting" the animals so that this danger could be averted.

S. describes how, working against time and often under appalling conditions of weather and terrain, a surgical operation was devised, a team of surgeons was trained in the technique and a total of over 5,000 mules and ponies were operated upon.

The operation, exact details of which are given, was based upon Hobday's operation for roaring, the essential modifications being that in addition to stripping the mucous membrane from the vocal cords the vocalis and ventricularis muscles underlying the cord were removed. Chloral hydrate given intravenously was used as an anaesthetic.

Of 5,563 animals operated upon mortality was 43, or 0.77%, an astonishingly good result in a tropical country under emergency conditions and during monsoon weather.—M. C.

REPORTS

I. TANGANYIKA TERRITORY. (1942.) **Annual report of the Department of Veterinary Science and Animal Husbandry, 1941. (Part I.) Routine activities and normal progress of the Department.** [LOWE, H. J.] pp. 9. Dar es Salaam: Govt. Printer. fcp. Sh.1/-. 254

II. TANGANYIKA TERRITORY. (1943.) **Annual report of the Department of Veterinary Science and Animal Husbandry for the year 1942. Routine activities and normal progress of the Department.** [LOWE, H. J.] pp. 15. Mpwapa: The Department. 8vo. 255

III. TANGANYIKA TERRITORY. (1945.) **Annual report of the Department of Veterinary Science and Animal Husbandry for the year 1944.** [LOWE, H. J.] pp. 20. Dar es Salaam: Govt. Printer. 4to. Sh. 1/-. [For report for 1943, see V. B. 16. 462.] 256

I. This report records the efforts of the Tanganyika veterinary department to meet wartime commitments during a year of drought; that success was achieved is indicated by the record figures for the marketing of livestock and livestock products. The territory has a cattle population of six million.

ANTHRAX and BLACKLEG are enzootic and TUBERCULOSIS in zebu cattle is common in the southern part of the country.

There are nine BOVINE CONTAGIOUS PLEURO-

PNEUMONIA quarantine areas, containing 231,000 head of stock. Work in the control of this disease was held up owing to lack of staff and two important extensions of the disease occurred.

In June an unexpected outbreak of RINDERPEST occurred near the Rhodesian border and in its control Nyasaland, Northern Rhodesia, Kenya and the Union of South Africa co-operated with Tanganyika Territory. Game-proof fencing was a feature of the control measures adopted and in addition to the fence constructed by the Northern Rhodesia staff, the Tanganyika Authorities built 26 miles of fence 8-10 ft. high at a cost of about £40 per mile: it was a success. As a result of this co-operation only one nidus of infection remained at the close of 1941; 1,740,291 Kenya attenuated goat virus injections had been given, together with some quarter million vaccinations.

EAST COAST FEVER and tick-borne diseases cause from 50-100% mortality in calves; dipping facilities are available on the scale of one dip per 100,000 head of cattle.

Two-thirds of Tanganyika Territory is under the domination of tsetse fly. It is advocated that "man-stock areas should be kept sharply defined from game-and-tsetse areas", thus reducing the reclamation problem to one of controlling the settlements' borders; the effectiveness of this control has been demonstrated at the Veterinary

Headquarters (Mpwapwa) which lies in "fly" bush, where herds of cattle are kept in an area contiguous with "fly".

Laboratory items in the report under review are very greatly curtailed as a result of wartime restrictions; some 6,400 specimens were, however, examined and one-quarter million doses of rinderpest vaccine were manufactured as a routine measure.

In the field of animal husbandry it was only possible to give the barest outlines of the work done. These included the large-scale encouragement of natives to make reserves for dry-season grazing and the provision of water supplies by dam and hafir construction under native conditions. Considerable research work was done: FRENCH worked on the nutrition of pigs and the rate of hair growth of cattle as affecting their suitability for use in the tropics. It is noted that sterility of uncertain aetiology occurred when pure-bred dairy cattle were kept at the coast in tropical heat.

The breeding policy of the Department is based on the building-up of the local types of stock so as to retain their immunity and their resistance to their environment, coupled with attempts to improve that environment.

An unspecified number of cattle, running into many thousands, were exported to Kenya; to achieve this successfully, stock routes were improved at a cost of some £3,000.

Animal produce also received its share of attention and in spite of the difficulties of obtaining plant, clarified butter production was increased by 57.6% to some 4,500 cwt., valued at £19,000; in addition to this over £100,000 worth of ghee was produced. In the sphere of hides and skins production, frame drying came to be regarded as the equal of shade drying. Legislation compelling purchase of hides and skins by grade and weight through licensed buyers was enacted. Shortage of staff and funds precluded an attack on the three diseases which do so much damage to pelts: STREPTOTHRICOSIS, FOLLICULAR MANGE and SARCOPTIC MANGE; these cost the Territory much money.

Six African veterinary assistants passed their course at Mpwapwa.

II. The year was a good one and there was adequate grazing. The two main occupations of the Department were RINDERPEST control and the provision of supplies of animal produce for the Forces; in both activities substantial results were achieved in spite of wartime restrictions and difficulties. £43,000 were received by the Department from Territorial funds and nearly £40,000 was returned either to the Government or to the Native Authorities in the form of revenue,

ANTHRAX decreased on stock routes from Tanganyika Territory to Kenya, as a result of vaccination. Both TUBERCULOSIS and BOVINE CONTAGIOUS ABORTION were observed more frequently and widely and CONTAGIOUS VAGINITIS of bovines was recorded in the Temeke dairy (Dar es Salaam). FOWL TYPHOID and MANGE in a variety of forms were far from controlled owing to the lack of personnel and funds.

The institution of TRYPANOSOMIASIS hand-dressing centres along stock routes and the use of 897 (phenanthridinium chloride) has almost eliminated danger to slaughter stock passing through the tsetse belts.

A deterioration in the tsetse fly position is, however, recorded and it is stated that "even with the expenditure of large sums of money the people are not there to maintain the clearings. The only method likely to prove effective under present conditions is the concentration of population in sufficient density to allow them to defend their settlements". The position of FOOT AND MOUTH DISEASE remains unsatisfactory. RABIES, EAST AFRICAN SWINE FEVER and CAPRINE CONTAGIOUS PLEURO-PNEUMONIA, with high mortality, were confirmed in the Musoma district. Funds were allocated with which to bring BOVINE CONTAGIOUS PLEURO-PNEUMONIA under control within five years.

The position of RINDERPEST was far better than in 1941. The disease existed at the end of 1942 in only one area on the Lake Victoria-Kenya border; danger of its spread to the southern areas of Africa had been removed and some two and three-quarter million injections had been given. This tremendous achievement involved the co-operation of neighbouring territories and left but few officers to deal with normal activities. Formol-glycerin and glycerin-water RINDERPEST vaccines which had been stored for months in a refrigerator induced a high protection when used within 40 days of exposure to room-temperature [work of EVANS & WILDE]. A further study of sterility in zebu was made and is reported by WILDE. Phenanthridinium chloride 897 received favourable mention.

The relationship of game to sundry tropical animal diseases is stressed as a subject of which we know little. To meet this deficiency a zoo has been founded at Mpwapwa and a study of disease in relation to game is being undertaken.

Wartime economy prevented much discussion in the report of animal husbandry research, but a considerable amount was done both in grazing trials and breeding work. It was found that cottonseed should be fed with caution to pigs; if fed to excess it may cause death. The colour of hair has no effect on the quality of skins; the

smaller pelts were usually found to be better prepared, no doubt because they could be pulled more easily. In the general field of animal husbandry the main task was the provision of dry-season grazing reserves and water supplies and the improvement of some 2,000 miles of stock routes and of marketing facilities. Marketing of cattle, which is under the direct control of the Director of Veterinary Services, increased greatly: in 1942, some 238,000 head of stock were sold for £400,000 on the 76 established markets; numbers rose by 13% and values by 35% over those reported in 1941. A quarter of a million goats were marketed at an average price of Sh. 6/-. The average weight of the 61,829 head of cattle which were sent to Kenya was 472 lb., a very satisfactory figure when it is remembered that they frequently have to trek 400 miles from Tanganyika to Kenya over rough country. The provision of improved breeding stock is also a function of this Department and zebu bulls, pigs, goats, kara kul rams and poultry were issued.

It is stated that apart from great increases in animal produce little advance has been made, nor will be made in animal husbandry until farm schools are instituted; animal husbandry is the key to successful farming and disease control is essential in animal husbandry.

The Ministry of Supply of the United Kingdom pegged prices and took over the disposal of hides and skins and the exporters formed themselves into a group to organize their trading activities. Clarified butter production increased in both amount (38%) and in value (46%) to £27,564; 111 creameries were in operation: these centres were for the most part sound financial ventures and enabled a distribution of skim milk to be made to the non-cattle-owning members of the community, thereby improving nutrition. Steady pressure was maintained to raise the quality of ghee, and schools were held to give instruction. 44,000 cwt. of ghee were manufactured, having a value of £172,000. The making of fresh butter and cheese, the provision of fresh milk supplies in the townships and the improvement of pigs and their products were also considered.

III. Drought conditions continued from 1943 into 1944. The cattle population fell by some 200,000 head and the sheep and goat statistics indicate a drop of 20% to just over four million. The hardiness and resistance of the zebu to disease and severe climatic conditions suggest that very careful consideration must be given to any policy for "improving" the breed.

The staff of the Department consisted of five senior veterinary officers, 14 veterinary officers, one temporary veterinary officer, five live-

stock officers, five senior assistant livestock officers, ten assistant livestock officers, five stock inspectors, ten game observers and 19 temporary stock inspectors. Fourteen vacancies for European personnel remained at the end of the year. £82,850 were received by the Department from Territorial funds and £22,610 from the Colonial Development and Welfare Fund. The livestock industry returned a revenue of £55,777 to the Government and of £24,010 to the Native Authority Treasuries.

Little information is added to that given in former reports on the subjects of ANTHRAX, TUBERCULOSIS, BLACKLEG and FOOT AND MOUTH DISEASE, but it is interesting to record that ANTHRAX injections into 143,000 head were of great value to trade stock, and that while FOOT AND MOUTH DISEASE is itself of little trouble it can cause heavy mortality in such stock by compelling them to remain in EAST COAST FEVER areas. It is noted that CONTAGIOUS ABORTION is being recorded more frequently and that BOVINE MASTITIS has so far been confined to grade cattle; it is thought that breeding with European stock may reduce the natural resistance of the zebu. Numerous other diseases are mentioned; those of major economic importance are probably FOLLICULAR MANGE and STREPTOTHRICOSIS in cattle and SARCOPTIC MANGE in goats, all of which cause very considerable losses to the hides and skins industry.

EAST COAST FEVER in areas where it is enzootic destroys 50% of the calf crop, but a note of warning is sounded that total eradication of the disease would quickly lead to overstocking; on the other hand, many of these cattle areas have insufficient animal nutrients for the populace. Hand-dressing of slaughter stock, if thoroughly carried out, proved useful on stock routes. There was a decline in the incidence of BOVINE CONTAGIOUS PLEURO-PNEUMONIA and in one area 539,000 injections of culture strains (Kenya) S.1144 and S.3773 were given, each beast receiving two injections of 1 ml., the first in the tail and the second in the shoulder some 6-8 weeks later. This was the second year in which inoculations were carried out in this area; it is considered that what was once an enzootic area has now been reduced to a state in which total suppression of the disease is likely. In other areas, some 150,000 head of cattle are held in quarantine awaiting the qualified staff urgently needed to deal with this problem. 50,000 ml. of RINDERPEST vaccines were produced during the year in the laboratory and it is stated that 208 doses were obtained from one animal. Experiments on the relationship between game and RINDERPEST had to be suspended. Research work was carried out on *T. rhodesiense*

infection in cattle [see WILDE & FRENCH—V. B. 16. 217]. Work continued on vaccine strains 19 and 45 (CONTAGIOUS ABORTION) and in the use of serum in CONTAGIOUS ABORTION very satisfactory results are said to have been achieved, leading to co-operative experiments with the medical authorities. The position of RINDERPEST, which had been considered very satisfactory at the end of 1943, deteriorated during the year and there was a general spread southward along the whole front from Lake Victoria to the Indian Ocean. At the end of the year, in spite of the inoculation of some 808,000 head of cattle with Kabete attenuated goat virus, no assurance could be given that the disease was under control. It is interesting to note that in one outbreak the virulence of the virus became enhanced to a point where it was able to infect and kill the oryx, lesser kudu and bushbuck, species not ordinarily susceptible to the virus. An outbreak of RINDERPEST also occurred in Zanzibar and was suppressed by personnel from Tanganyika.

The usual meat inspection service was maintained and some 51,000 cattle, 45,000 sheep and goats and 1,100 pigs were examined; the main causes of condemnation were *Cysticercus bovis* and *C. cellulosae*. It is urged that animal husbandry with its provision of animal nutrients is one of the most important factors in raising the standards of African civilization. Only one native in ten had sufficient physique to pass into the Army, for which malnutrition was largely responsible. Research continued in animal husbandry and pasture work but no details are given in this condensed wartime report. Demonstration farms were maintained in several localities and they demonstrated clearly the value of pasture control amidst violent erosion. The Department had under its control some 600 square miles as dry-season grazing, and in addition created reserves for town dairy stock. Some 86,000 castrations were performed.

A considerable amount of successful effort was made to improve the stock routes of the Territory, which are some 2,000 miles in length. Better water supplies were made (in one case a mountain stream was piped four miles to the plains), increased grazing facilities were provided and veterinary measures, including dipping and hand-dressing, ANTHRAX inoculations and in some cases RINDERPEST inoculations were instituted. The sales of livestock through Departmental organizations mounted to 363,000 head of cattle, having a value of some £856,000, which connotes a rise of only Sh. 2/- per head over the 1943 price. The average price of a beast rose from Sh. 17/46 in 1938 to Sh. 44/39 in 1944. The production of clarified butter was maintained, but

ghee production figures fell as a result of drought and black marketing. Ghee grading was instituted and better work rewarded; a rise in the price of milk was contemplated to increase production. 1,769 cream separators were in operation. An attempt to improve low-grade ghee by deodorizing was not successful. Fresh butter and cheese production figures show substantial increases, but it is observed that milk produced by the Departmental dairy in Dar es Salaam cost Sh. 2/80 per gal., making it too expensive for the African population.

There was no new recruitment for the course for African veterinary assistants during the year and no course was given; four African animal husbandry assistants are, however, under training.

Thirteen departmental publications were made during the year and a local publication of an informal nature entitled *Veterinary Notes* was instigated to keep departmental personnel *au fait* with current matters of technical interest not readily found in the literature.—E. F. PECK.

SWAZILAND. (1945.) [Report of] Division of Animal Health and Industry [for the year 1944]. [BARNARD, W. G.]—*Rep. vet. agric. Dep. Swaziland*, 1944. pp. 8-12. 257

A marked improvement occurred in the incidence of ANTHRAX, from which there were only ten deaths in the seven outbreaks diagnosed. FOOT AND MOUTH DISEASE did not occur during the year and no mention is made of RINDERPEST. Advances were made in the control of EAST COAST FEVER and 299 dipping tanks were in operation.

Smear examination is considered the basis for control of the more important diseases of stock; 64,291 slides were examined, as against 50,938 in 1943; this is the highest peak reached so far. Far fewer cattle were exported than in 1943.

—D. S. RABAGLIATI.

I. CHINA, SZECHWAN PROVINCE. (1941.) [Report on control of animal diseases, 1939.] [YEH, Y. S.]—*Agric. Bull.* No. 21. pp. 46. Chengtu: Bureau of Agriculture of Szechwan Province, Division of Prevention of Epizootics. 258

II. CHINA, SZECHWAN PROVINCE. (1941.) [Report on the control of animal diseases, 1940.] [YEH, Y. S.]—*Ibid.* No. 20. pp. 118. Chengtu: Bureau of Agriculture of Szechwan Province, Division of Prevention of Epizootics. 259

I. A total of 5,015 cattle was vaccinated against RINDERPEST and 596 cattle were treated. 1,141 pigs were vaccinated against SWINE FEVER and 215 pigs were treated. The work was undertaken by the Division of Prevention of Epizootics and a monetary loss of more than 550,000 Chinese dollars to the Province was saved.

II. A total of 2,504 pigs was vaccinated against SWINE ERYSIPELAS and 950 were treated for the disease. 7,418 cattle were vaccinated against RINDERPEST and 617 were treated. 2,978

See also *abst.* 225 (animal insurance work, Szechwan, China, 1939-40).

pigs were immunized against SWINE FEVER and 3,386 were treated. The work was undertaken by the Division of Prevention of Epizootics.

—S. J. CHU.

BOOK REVIEWS

WEST, T. F. [M.Sc., Ph.D. (Lond.), F.R.I.C.] & CAMPBELL, G. A. [M.Sc. (Leeds), F.R.I.C.] (1946.) **DDT the synthetic insecticide.** pp. xii + 301. 12 plates, 58 tables. London: Chapman & Hall Ltd. Svo. 21s. 260

The history of the development and application of the insecticide D.D.T. is one of the most fascinating stories of modern applied science, but as in all great discoveries an initial period of excitement has been followed by one of sober reflection.

At first the popular press led the general public to believe that the universal panacea for all insect pests had been found, but the more cautious scientist soon became aware that D.D.T., in solving some problems, revealed others. It was realized that a great deal of work on formulation, application and pharmacological action had to be carried out before general directions could be given for its use.

All workers on this subject will find this book invaluable for reference. The authors have been associated with the work on D.D.T. since its adoption by the United Nations, and CAMPBELL was responsible for introducing it to the British authorities in 1942.

The first part of the book describes the studies of LAUGER and his co-workers in Switzerland, which led up to the discovery of the insecticidal properties of D.D.T. The discovery followed 20 years of patient work and a brief summary of the chemical evolution is given in chapter I. This chapter is of the greatest interest to the physiologist, the chemist and the student. However, LAUGER'S original paper, from which it is taken, is of such great importance, especially in its approach and in the technique of the evolution of the insecticide, that in future editions this chapter could very profitably be expanded.

In succeeding chapters the chemistry, manufacture, toxicity, formulation and application of D.D.T. against pests is described. Each chapter is a well balanced and accurate survey of the work reported up to the middle of 1945. The bibliography, which is most comprehensive, is arranged chapter by chapter, and facilitates easy reference to each particular aspect of the subject.

While the flow of recent papers has greatly expanded our knowledge of D.D.T. and may lead us to revise some of our earlier conceptions, the

book forms a most valuable guide to the study of D.D.T.—W. MOORE.

ANON. (1946.) **Penicillin therapy.** pp. 61. Nottingham, England: Boots Pure Drug Co. Ltd. 261

This booklet of 61 pages gives the principal indications for penicillin therapy in human beings and contains references to recent articles in British, American and Dominion medical journals. The properties of penicillin, indications for its use, methods of administration and dosage, many clinical reports and presentation of penicillin and penicillin preparations are covered.—E. M. J.

— (1946.) **Annual review of biochemistry.** Volume XV. [Edited by LUCK, J. M. (Stanford University), SMITH, J. H. C. (Carnegie Institution of Washington, Division of Plant Biology, Stanford University), & LORING, H. S. (Stanford University).] pp. xiii + 685. Stanford University P.O., Calif.: Annual Reviews, Inc. Svo. \$5.00. 262

The current volume of this excellent annual review series contains several chapters which may be of special interest to veterinarians, including "Growth factors for microorganisms" by E. E. SNELL and "Bacterial metabolism" by H. A. BARKER & M. DOUDOROFF. "Immunochemistry" by E. A. KABAT is particularly valuable because of the references given to books and reviews dealing with general and specialized subdivisions of the subject. The author deals with quantitative methods and their applications, antibodies, antigens, chemically altered antigens, complement and immune reactions. In "Organic insecticides" by W. M. HOSKINS & R. CRAIG, insecticides of plant origin, synthetic organic compounds used as insecticides, improvements in the application of insecticides and their mode of action are discussed. Other chapters of interest are "The viruses" by N. W. PRIE, and "The vitamins" by R. A. DUTCHER & N. B. GUERRANT. In previous volumes the vitamins have usually been allocated two chapters, one dealing with the fat-soluble vitamins and the other with the water-soluble vitamins. This year there is only the one chapter, which includes a review of the latest work on both. There is a useful section devoted to the importance of vitamins in the nutrition of domesticated and other animals.

The volume also includes "Biological oxidations and reductions" by K. A. C. ELLIOTT, "Non-oxidative enzymes" by A. M. WYNNE, "Plant carbohydrates" by S. PEAT, "The chemistry of the lipids" by J. B. BROWN, "The chemistry of the proteins and amino acids" by T. L. McMEEKIN & R. C. WARNER, "The chemistry of the steroids" by T. REICHSTEIN & H. REICH, "Carbohydrate metabolism" by C. F. CORI & G. T. CORI, "Fat metabolism" by W. C. STADIE, "The metabolism of proteins and amino acids" by D. RITTENBERG & D. SHEMIN, "The chemistry of the hormones" by H. SELYE & H. JENSEN, "The biochemistry of the teeth" by H. M. LEICESTER, "Photosynthesis" by C. S. FRENCH, "The respiration of plants" by W. O. JAMES, "The biochemistry of yeast" by C. NEUBERG, and "Inactivation and detoxication of pressor amines" by W. H. HARTUNG.

Good author and subject indexes are given and each chapter contains an excellent list of the literature cited.—R. ALLCROFT.

SUTTON, R. L. [M.D., Emeritus Professor of Dermatology, University of Kansas Medical School] & SUTTON, R. L., Jr. [M.D., Assistant Professor of Dermatology, University of Kansas Medical School]. (1942. Reprinted 1944, 1945.) **Synopsis of diseases of the skin.** pp. 481. 413 figs. St. Louis: C. V. Mosby Company. 8vo. 263

In this small book on skin disease in man the authors have included a vast amount of information including more than 750 references to the literature. The common diseases receive most space, the rarities are sometimes merely listed. Throughout the text the importance of a knowledge of the real nature of disease is stressed, together with the risk in treating potentially dangerous conditions without adequate precaution.

The first 55 pages deal with the anatomy and physiology of the skin and with skin diseases in general and their treatment. The rest of the book deals systematically with skin disorders, grouped so far as possible on an aetiological basis. Disorders of the skin in animals are only rarely mentioned, except for reference to the transmission of ringworm from animals to man. In this connection the authors state that fungi which are principally pathogenic to man cause chronic, resistant, non-inflammatory lesions in human beings, whereas in animals such fungi cause deeply inflammatory lesions. On the other hand fungi

which are principally pathogenic to animals cause superficial lesions in animals; the diseases concerned are readily transmissible from animal to animal, the organisms are easy to demonstrate, and the lesions are difficult to cure. In man, however, the animal pathogens cause deeper lesions; there is strong reactivity to fungus extracts, the disease is difficult to transmit and the causal organism can be isolated from the lesions only with difficulty, and lesions are easily cured or disappear spontaneously.

The volume can be read with interest by all who are concerned with skin diseases. It is well printed; the illustrations, including the many photomicrographs, are excellent and there is a good index.—E. G. WHITE.

STERN, R. A. [M.D., Assistant Attending Physician, City Hospital, New York City]. (1945.) **Trauma in internal diseases. With consideration of experimental pathology and medicolegal aspects.** pp. xxiv + 575. London: William Heinemann (Medical Books) Ltd. 8vo. 30s. 264

The relation of internal disease to trauma is summarized as follows:—Trauma may produce degenerative changes, sometimes ending in necrosis, either by its direct action on the tissues, or by interfering with the local blood supply, and acute or chronic inflammatory processes may develop in internal organs. Infection may complicate traumatic injury: the trauma may create a point of entry for pathogenic organisms, or may give organisms invading the blood-stream before or after the injury the opportunity to localize at the point of weakened resistance. Finally, besides the consequences of injury directly connected with anatomical changes in the affected organs, there can develop also functional diseases for which an anatomical basis is not at present evident. Thus, apart from being a direct cause of injury, trauma may act as a provocative or an accelerating factor in disease.

In writing this book, the author has provided the medical witness, who may be required to give an opinion in court in compensation cases on the relation of trauma to subsequent internal disease with an extensive critical review of the literature, consisting mainly of case histories, especially those with detailed P.M. findings. Some account is also given of recorded experimental work bearing on the problem. Apart from its special value, however, the book should prove of interest to all concerned with the relation of trauma to internal disease.—E. COTCHIN.

See also *abst.* 190 (organic iodine compounds tested against insects, fungi and bacteria, and review of the literature).

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

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